3018.

FLOOD PLAIN INFORMATION

UVAS-CARNADERO CREEK

PAJARO RIVER
TO
UVAS RESERVOIR

SANTA CLARA COUNTY, CALIFORNIA

TC
425
U8.F56
1973
REF

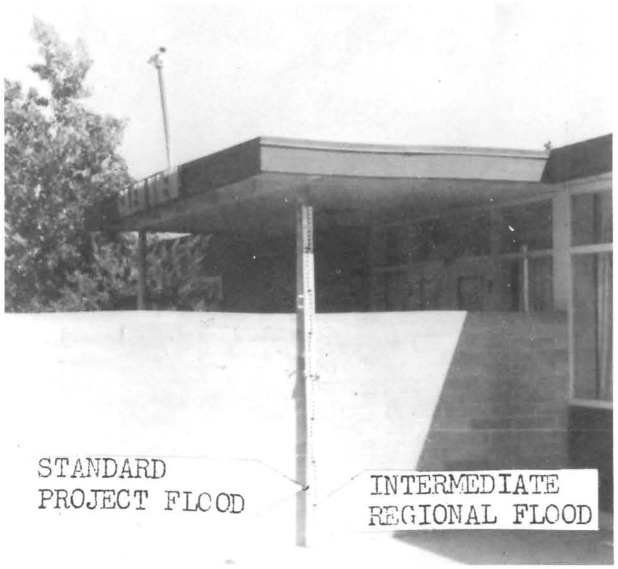
PREPARED FOR SANTA CLARA COUNTY
FLOOD CONTROL AND WATER DISTRICT BY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAN FRANCISCO
MAY 1973

ACTION IS NEEDED

The flood plain of Uvas-Carnadero Creek is primarily agricultural but development can be expected in the future. The devastating effects of flooding will continue to increase unless action is taken.

Effective regulatory measures such as zoning ordinances and building codes can be designed to prevent increased flood damages. Flood proofing can reduce potential damages to properties already subject to flooding, and additional works to modify flooding can also be part of the long run solution. Prior flood control projects have already provided partial flood protection.

Uvas-Carnadero Creek is not the only stream with flooding problems. Flood plain information has already been provided for many of the several thousand flood prone areas. Many of those having FPI Reports have adopted or strengthened regulations, while others have them under study. Some communities have used the FPI Reports to establish interim land use control.



Flood Potential Glen View School

This folder has been prepared for the Santa Clara County Flood Control and Water District by the U.S. Army Corps of Engineers from data in the report "Flood Plain Information, Uvas-Carnadero Creek, Santa Clara County, California." Copies of the report and this folder are available upon request from the Santa Clara County Flood Control and Water District, 5750 Almaden Expressway, San Jose, California 95118.

Inside are sketches illustrating the horizontal and vertical relationships of flooded areas and a flood area map from the report showing the extent of both a large flood (IRF) and a very large flood (SPF).

FLOODS

ON

UVAS — CARNADERO CREEK

Near

GILROY, CALIFORNIA

July 1973

FLOODS

ON THE

UVAS—CARNADERO CREEK

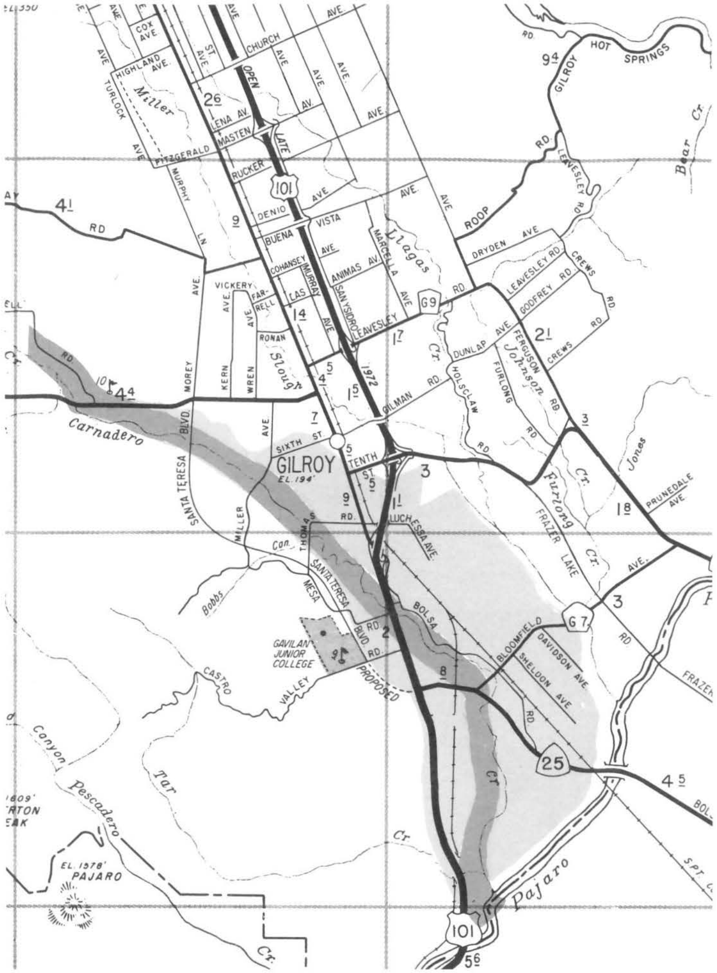
This folder is an announcement of and supplement to the "Flood Plain Information Report (FPI) Uvas-Carnadero Creek, Santa Clara County, California." The report has been prepared because a knowledge of the flood potential and flood hazards is important in land use planning and for management decisions concerning flood plain utilization.

Although extensive flood damage has occurred on Uvas-Carnadero Creek in the past, studies indicate that even larger floods can occur in the future. Emphasis is given to future floods in the FPI Report. Maps, profiles, and cross-sections have been included to illustrate the possible extent and severity of future floods.

HIGHEST FLOODS RECORDED ON UVAS—CARNADERO CREEK NEAR GILROY

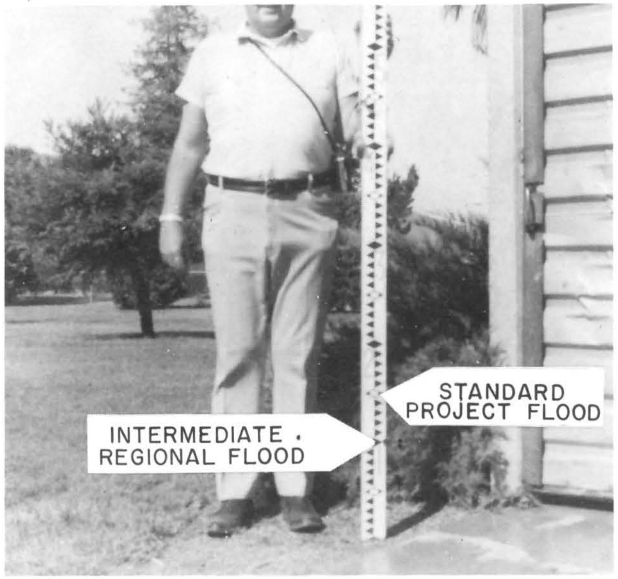
Date of Crest	*Stage in Feet*
1 February 1963	17.66
6 January 1965	9.22
6 March 1962	7.83
Large (100-yr) - IRF	20.00*
Very Large - SPF	20.00*

*Maximum Bank Height

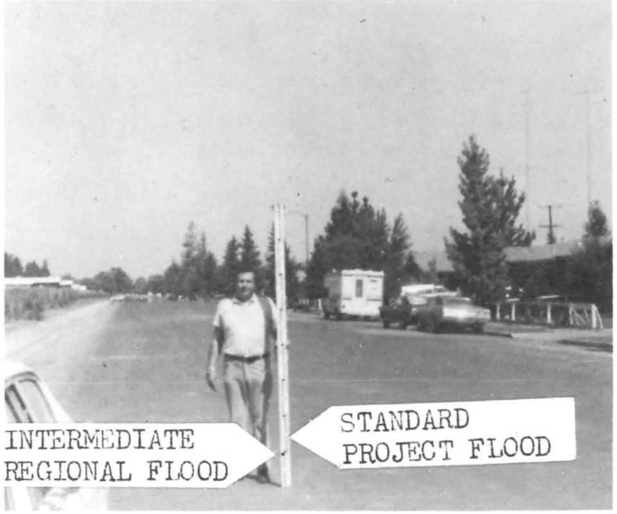


Basic Map Reproduced by Permission of the California State Automobile Association, Copyright owner.

INFORMATION REGARDING FLOODING ALONG UVAS—CARNADERO CREEK FROM UVAS DAM TO THE PAJARO RIVER MAY BE FOUND IN A REPORT PUBLISHED BY THE SAN FRANCISCO DISTRICT OF THE CORPS OF ENGINEERS. THE REPORT TITLED "FLOOD PLAIN INFORMATION UVAS—CARNADERO CREEK" WAS PREPARED FOR — THE SANTA CLARA COUNTY FLOOD CONTROL AND WATER DISTRICT. THE REPORT IS AVAILABLE FROM THEIR OFFICE. THE LIMITS OF THE FLOOD PLAIN AND THE STUDY ARE INDICATED ON THE MAP.

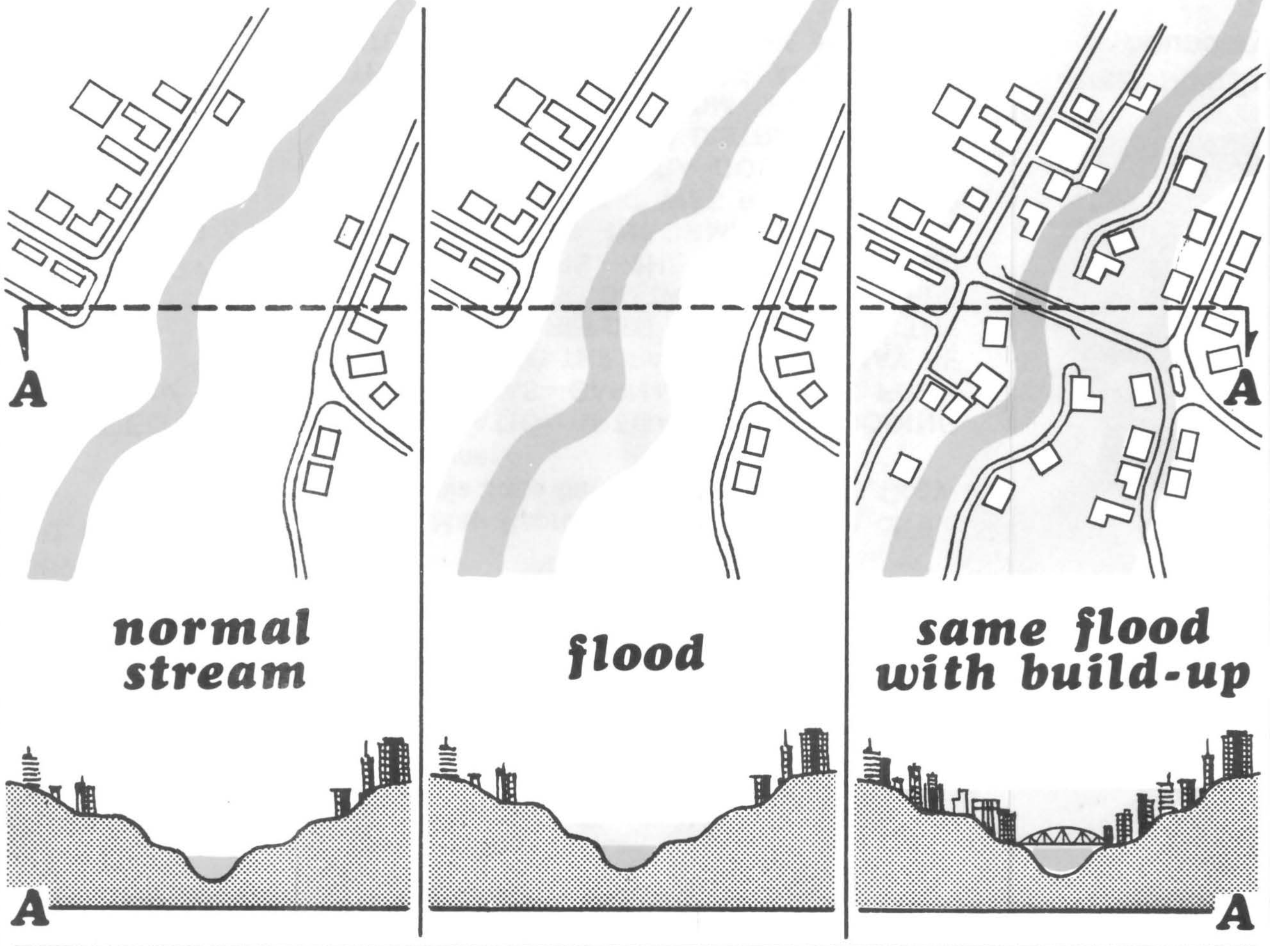


Flood potential at Christmas Hill Park



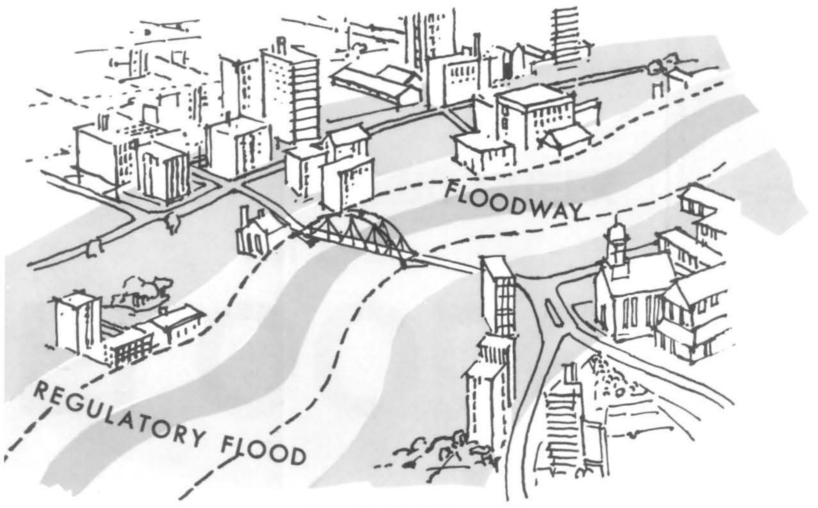
Street flooding potential along the city boundary near Church and 12th

BUILDING in the LOOD PLAIN can make FLOODS WIDER and DEEPER



this ENCROACHMENT can change a Small Flood into a MAJOR FLOOD

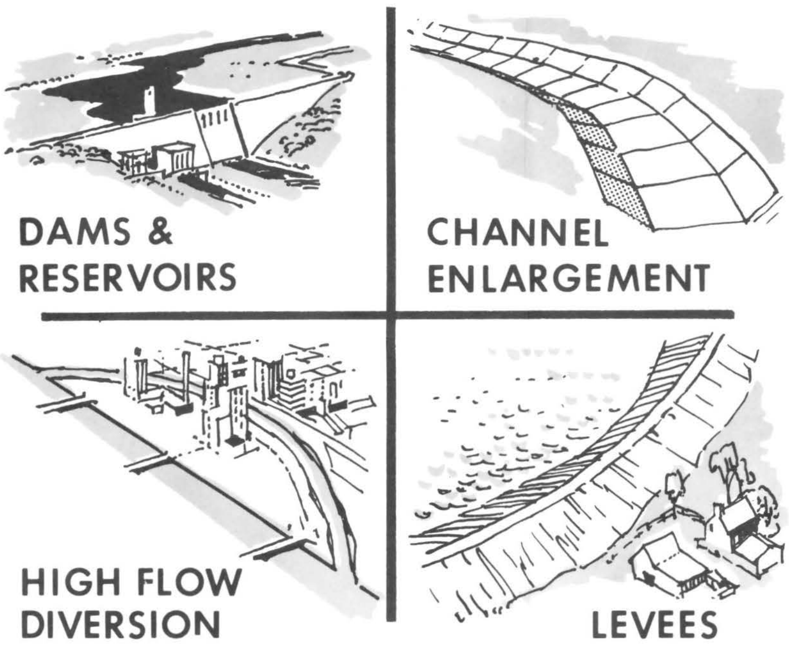
TOOLS of FLOOD PLAIN MANAGEMENT for the reduction of Flood Damage and Human Suffering



MEASURES TO REDUCE *VULNERABILITY O FLOODS provide for a future with more freedom rom flood damage, often at minor cost and with little dverse effect on the environment • • • • • •*

REGULATIONS
(ZONING, BUILDING CODES, SUBDIVISION)
• FLOOD PROOFING • RELOCATIONS •
• URBAN RENEWAL •

MEASURES TO MODIFY FLOODS *are often required to alleviate existing problems and sometimes to forestall future problems • • •*



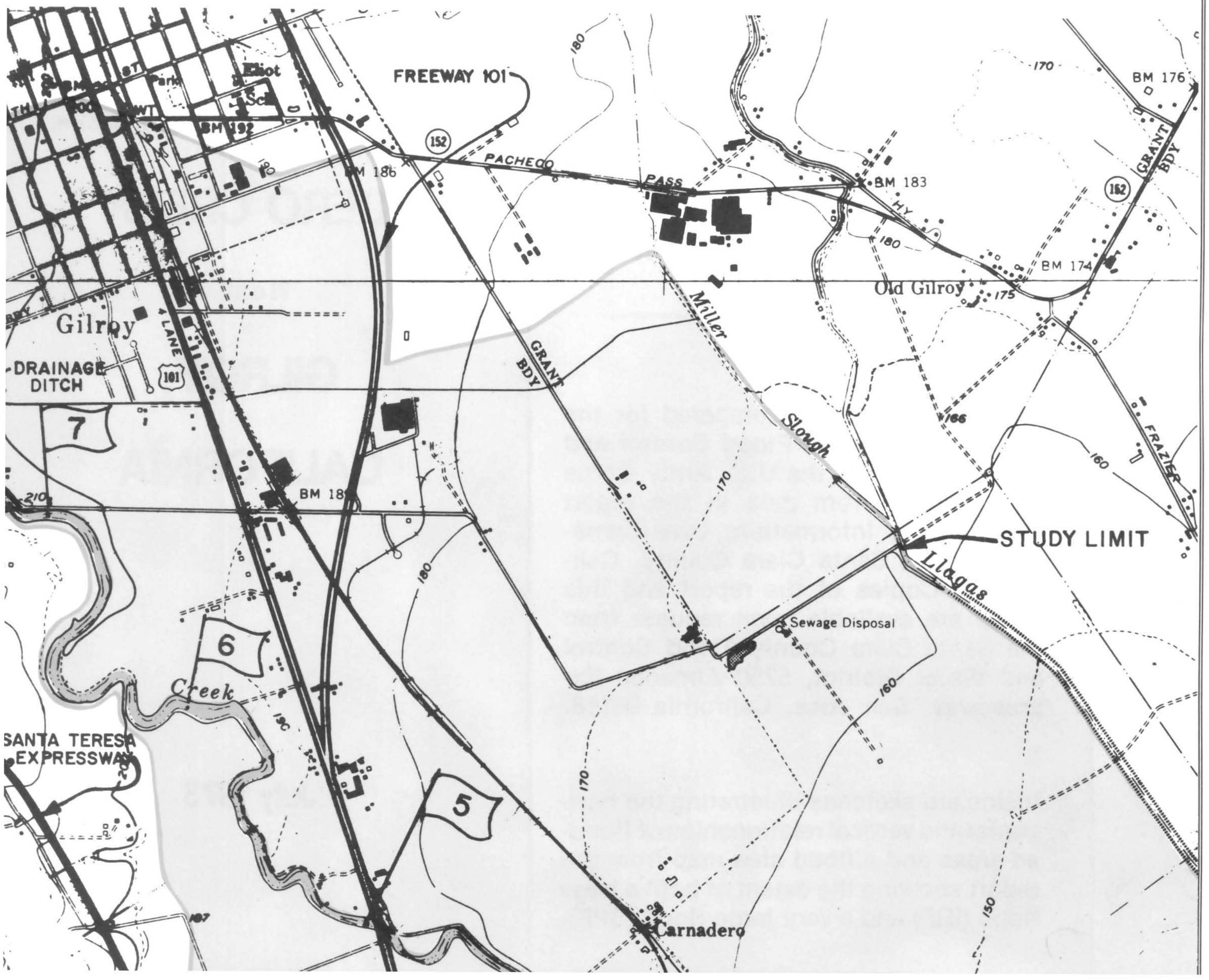
OTHER MEASURES *aid the Flood Plain occupant in coping with floods • • •*

EDUCATION

TAX ADJUSTMENTS

FLOOD INSURANCE

WARNING & EMERGENCY PLANS



FLOOD PATTERNS

FOR
UVAS-CARNADERO CREEK NEAR GILROY,
SANTA CLARA COUNTY, CA.

LEGEND

approximate limits of overflow

▨ NORMAL STREAM

░ INTERMEDIATE REGIONAL FLOOD (IRF) AND STANDARD PROJECT FLOOD (SPF)

PROFILES in the Flood Plain Information Report show elevations of these floods for the entire study area

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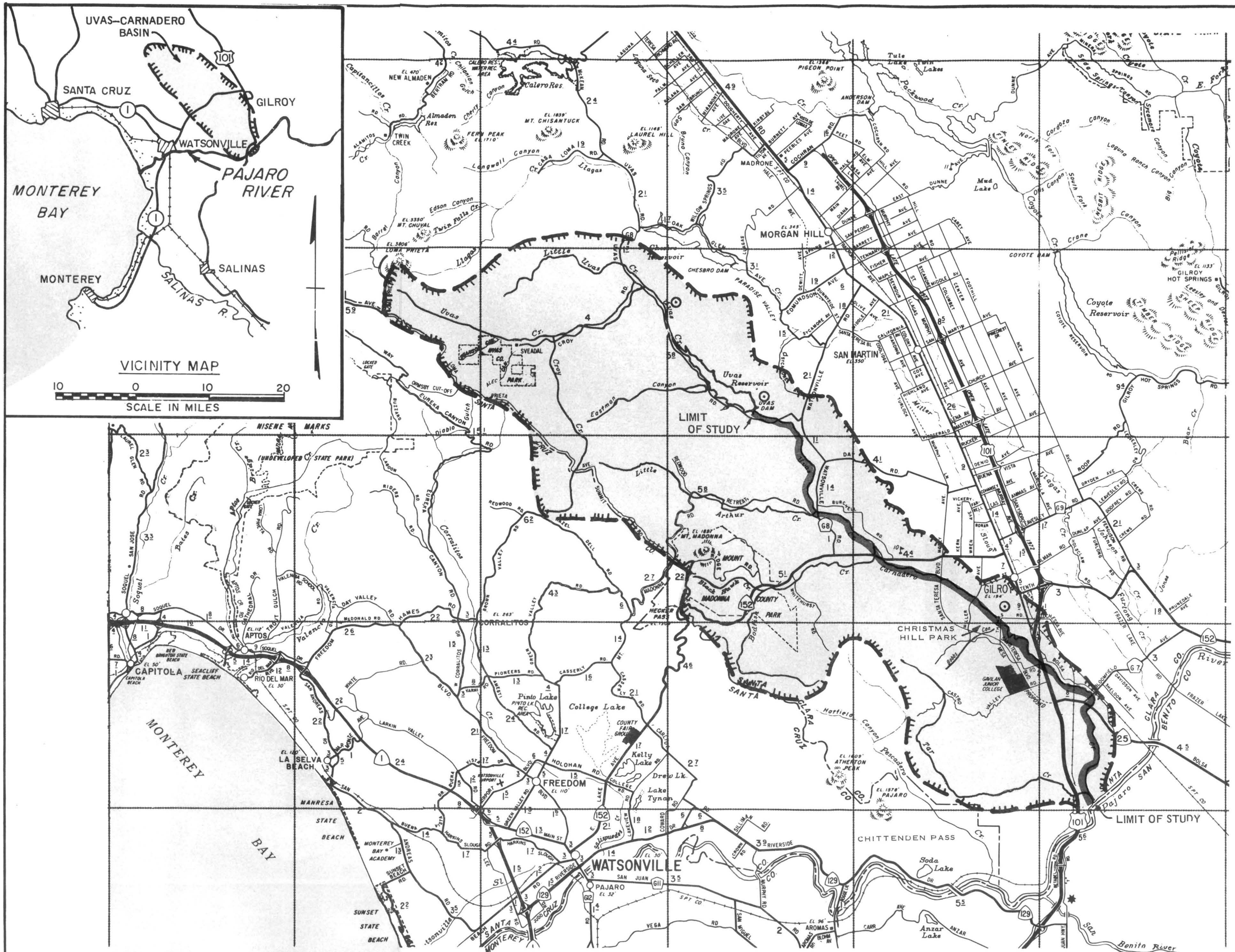

LEGEND

50	U.S. HIGHWAY
1	STATE HIGHWAY
G2	COUNTY HIGHWAY
⊙	STREAM GAGING STATION
	UVAS–CARNADERO CREEK DRAINAGE BASIN
	STUDY REACH

0 1 2 3
SCALE IN MILES

BASE MAP REPRODUCED BY PERMISSION OF
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DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA
FLOOD PLAIN INFORMATION
UVAS–CARNADERO CREEK
SANTA CLARA COUNTY, CALIFORNIA

GENERAL MAP

MAY 1973

PLATE 1

PREFACE

The area covered by this report is subject to flooding from Uvas-Carnadero Creek. The properties on the flood plain along this stream are primarily agricultural and were partially inundated by the flood of 1955. Studies indicate that even larger floods, than those of the past, are possible.

This report has been prepared because a knowledge of flood potential and flood hazards is important in land use planning and for management decisions concerning flood plain utilization. It includes a history of flooding in the Uvas-Carnadero Basin and identifies those areas that are subject to possible future floods. Special emphasis is given to those possible future floods through maps, photographs, profiles, and cross sections. The report does not provide solutions to flood problems; however, it does furnish a suitable basis for the adoption of land use controls to guide flood plain development and thereby prevent intensification of the loss problems. It will also aid in the identification of other flood damage reduction techniques such as works to modify flooding and adjustments including flood proofing which might be embodied in an overall flood plain management (FPM) program. Other FPM program studies, those of environmental attributes and the current and future land use role of the flood plain as part of its surroundings, would profit from this information.

At the request of the Santa Clara County Flood Control and Water District and endorsement of the California Department of Water Resources, this report was prepared by the San Francisco District Corps of Engineers, under continuing authority provided in Section 206 of the 1960 Flood Control Act, as amended.

Assistance and cooperation of the California Division of Highways, the Santa Clara County Flood Control and Water District and private citizens in supplying useful data and photographs for the preparation of this report are appreciated.

Additional copies of this report can be obtained from the Santa Clara County Flood Control and Water District. The San Francisco District Corps of Engineers, upon request, will provide technical assistance to planning agencies in the interpretation and use of the data presented as well as planning guidance and further assistance, including the development of additional technical information.

BACKGROUND INFORMATION

Settlement

During the latter part of the 1700's, Santa Clara Valley served as a crossroads for the Spanish exploration expeditions coming from Mexico. The Spanish Padres established a mission in the Santa Clara Valley that served as a spiritual, educational and cultural center for the surrounding area, and as an overnight way station for travelers.

Gilroy, lying on the northeastern edge of the Uvas-Carnadero drainage basin, was settled by John Gilroy, a Scotch sailor and the first permanent non-Spanish settler of California. In 1814 Gilroy was left ashore in Monterey by the Hudson's Bay vessel "Isaac Todd," because he was sick with scurvy. His real name was Cameron, but he changed it to his mother's family name because he had left home as a minor and was in danger of being sent back. He settled in the Santa Clara Valley where he married Maria Clara Ortega, the grantee of part of the San Ysidro land grant. The settlement which developed on the rancho became known as San Ysidro, and later as Gilroy. After the coming of the railroad in 1869, the name Gilroy appears on the map for the station, and Old Gilroy (San Ysidro Post Office) for the older settlement. Gilroy Hot Springs was discovered in 1865 by a Mexican sheepherder while he was hunting for some of his flock, and was named for the town years later. The Spanish name for Gilroy Valley was Llano de las Llagas. (Las Llagas refers to "the wounds.")

The name of Uvas Creek was preserved through the name of the land grant, Canada de las Uvas, dated June 14, 1842. The word "uvas", was frequently used by the Spanish as the name for places where wild grapes were found.

The name of Carnadero Creek derives from the word carnadero probably meaning "butchering place," and is recorded as the name for a place in the vicinity as early as 1784. In the following decades, the name appeared repeatedly in documents and on maps, and was used as an alternate name for the Las Animas Grant. Animas is the name of a land grant dated November 28, 1808, and August 7, 1835. Las Animas (the souls) refers to All Souls Day. The land grant was also known as Carnadero and La Brea.

Castro Flats, also within the basin, is mostly on the Las Animas Rancho and was granted August 17, 1802 to Jose Mariano Castro, son of Joaquin Castro who came with the Anza Expedition in 1776.

The Stream and its Valley

The Uvas-Carnadero Creek system is approximately 26 miles long with its headwaters in the Santa Cruz Mountains, in southern Santa Clara County, and it flows generally southeast to join the Pajaro River about six miles south of Gilroy. The creek system drains an area of about 90 square miles. A general map of the basin is shown on Plate 1 of this report.

Basin elevations range from a little over 100 feet, mean sea level at the Pajaro River, to heights in excess of 3,000 feet in the upper basin.

The Uvas-Carnadero Creek Basin is primarily mountainous, however, in the northeast portion of the basin about one fifth of the area is devoted to agriculture and orchards. There are no large urbanized areas in the basin.

The study area is bounded on the north, west and south by the Santa Cruz Mountains and on the east by the Llagas Creek drainage basin.

Official flow records are available dating from 1931 when a U.S.G.S. gage was established on the right bank of Uvas Creek 0.6 miles downstream of Eastman Canyon. Records from about 1959 are available for county gages. Drainage areas contributing to runoff at locations in or near the study area are shown in Table 1.

TABLE 1
DRAINAGE AREAS

Location	Drainage areas sq. mi.
Uvas Reservoir	30.4
Uvas Creek below Arthur Creek	46.3
Uvas Creek at Highway 101	73.0
Carnadero Creek at Mouth	90.0

The climate is characterized by warm summers, when temperatures may rise above 100 degrees, and mild winters although temperatures may drop below 20 degrees for short periods of time.

Developments In the Flood Plain

During the last two decades, Santa Clara County has experienced a phenomenal growth rate. Up to the present time, growth has centered around the San Jose area where housing tracts and light industry have gobbled up much of the surrounding agricultural land. At the present time about one-quarter of the land within the county has been urbanized. With most of the available land in the San Jose Area already utilized, urbanization will probably spread south along Highway 101 and into the valleys adjacent to the highways.

Continued population growth will probably cause Gilroy to expand to the south and west into the primarily agricultural flood plain of the Uvas-Carnadero Creek.

Uvas Dam was completed in 1957 by the South Santa Clara Valley Water Conservation District. The dam lies about 17 miles upstream of the junction of Carnadero Creek with the Pajaro River.

FLOOD SITUATION

Sources of Data and Records

Records of stages and discharges on the Uvas-Carnadero Basin system have been maintained since 1931. However, regulation by Uvas Reservoir makes adjustment of prior records necessary. After completion of Uvas Dam the gaging station was relocated onto the dam. Other stations within the basin are located on Uvas Creek near Gilroy and on Bodfish Creek near Whitehurst Creek. Gaging stations have also been maintained, over past years, by Santa Clara County Flood Control and Water District. Some of the stations within the basin record only low flows and are not applicable to the determination of floodflows.

The general map, Plate 1 is used with the permission of the Automobile Association of America and the flooded areas are shown on portions of current U.S.G.S. 7-1/2 minute quadrangle maps.

Table 2 lists crest stages and discharges that have occured at the stream-gaging station Uvas Creek near Gilroy.

TABLE 2
FLOOD CREST ELEVATIONS
UVAS CREEK NEAR GILROY
HIGHEST FOUR DISCHARGES SINCE COMPLETION
OF UVAS RESERVOIR

Date of Crest	Estimated Peak Discharge cfs	Stage	Elevation (a)
6 March 1962	1,540	7.8	194.4
1 February 1963	9,490	17.7	204.2
6 January 1965	2,270	9.2	195.8
25 January 1969	4,540	12.7	199.2

(a) Feet, mean sea level datum

Rainfall records have been maintained in Santa Clara County since 1874. Records are available from about 130 precipitation stations, many of which are currently in operation. Rainfall records of U.S. Weather Bureau Stations are published in the various climatological data publications.

Flood Season and Flood Characteristics

The main flood season for the Uvas-Carnadero Basin extends from November through April. About 93 percent of the precipitation occurs during these months.

Statistically, January is the wettest month, having about 20.7 percent of the precipitation. July with 0.3 percent of the mean annual precipitation is the driest month.

Factors Affecting Flooding and Its Impact

Obstructions to floodflows – There are 10 bridges and one culvert within the study reach and the locations and characteristics are shown in Table 4. Miller Road (Mesa Road) is a summer crossing with culverts for low flow.

Natural obstructions to flood flows include trees, brush and other vegetation growing along the streambanks in floodway areas.

Manmade encroachments on or over the streams such as dams, bridges and culverts can also create more extensive flooding than would otherwise occur.

During floods, trees, brush and other vegetation growing in floodways impede floodflows, creating backwater and increasing flood heights. Trees and other debris may be washed away and carried downstream to collect on bridges and other obstructions to flow. As floodflow increases, masses of debris break loose and a wall of water and debris surges downstream until another obstruction is encountered. Debris may collect against a bridge until the load exceeds its structural capacity and the bridge is destroyed. The limited hydraulic capacity of bridges or culverts where debris collects and retards floodflows may result in flooding upstream, erosion around the culvert entrance and bridge approach embankments, and possible damage to the overlying roadbed.

In general, obstructions restrict flows which result in unpredictable areas of flooding, damage to bridges and culverts; and, an increased velocity of flow immediately downstream. It is impossible to predict the degree or location of the accumulation of debris; therefore, for the purposes of this report, it was necessary to assume that there would be no accumulation of debris to clog any of the bridge or culvert openings in the development of the flood profiles.

Flood damage reduction measures– These measures have been limited to channel maintenance and construction, by local interests, of levees. Federal and State agencies have not participated in the construction of damage prevention measures.

A multiple-purpose dam and reservoir near Gilroy was found to be economically feasible by a Federal study but has been placed in an inactive status.

Uvas Dam was completed in 1957 by the South Santa Clara Valley Water Conservation District. The dam lies about 17 miles upstream of the junction of Carnadero Creek with the Pajaro River. Built with about 800,000 cubic yards of earth and rock, the dam rises 180 feet above the streambed of Uvas Creek to a crest elevation of 500 feet. The crest is 22 feet in width and 1,100 feet long and the permanent spillway lies 12.5 feet below the top of the dam. The reservoir, covering about 280 acres has a storage capacity of about 10,000 acre-feet and a drainage area of about 30 square miles.

Floodflows are regulated to some extent by the impoundment in Uvas Reservoir. However, Uvas Reservoir has no storage set aside specifically for flood control. During some floods, particularly at the beginning of the season when near empty, the dam has been instrumental in reducing flood peaks. However, the uncertainty of the degree of emptiness makes the reservoir unreliable for the reduction of flood peaks. A 36-inch pipeline from Uvas Reservoir conveys water to the Llagas Creek. Stored water in Uvas Reservoir is used to recharge groundwater aquifiers.

Other factors and their impact

Flood warning and forecasting - No specific river or flood forecasts are issued for the Uvas-Carnadero Creek by the Federal-State River forecast center in Sacramento. However, forecasts of heavy rain are provided to Santa Clara County by the NOAA, National Weather Service Forecast Office in San Francisco. General weather forecasts of intense rainfall with accompanying flood warnings are issued and are available by telephone, newspapers, radio and television.

Flood-fighting and emergency evacuation plans - The Santa Clara County Flood Control and Water District has organized an Emergency Operations Center. The Center consists of the Chief of Emergency Operations aided by a Public Information Officer and an Emergency Coordinator plus related support staffing. Four additional units, Data Collection, Flood Information, Water Operations, and Emergency Actions complete the organization.

The Emergency Operations Center is maintained in an "Alert" status from 1 October to 1 May each year. When the apparent situation requires 24-hour vigilence, the Center goes into a "Pre-Emergency" operation. As the gravity of the situation increases and flooding is occurring and threatens to increase, a full "Emergency" condition is entered into. Upon termination of emergency conditions, the Center reverts to the "Alert" status until the situation again changes or the flood season terminates.

Under the Center operation, the Data Collection and Flood Information Units primarily collect, organize, coordinate and publish information relating to the flood situation, flooding and flood damage. The Water Operation Unit operates the water system-reservoirs, pipelines, canals, etc. in order to minimize flooding and flood damage.

The Emergency Actions Unit with available crew does all emergency maintenance within its capabilities and supervises and coordinates the work of others.

Requests for Federal and/or State aid are initiated, coordinated and supervised through the Emergency Operations Center.

Material storage on the flood plain - The flood plain of the Uvas Creek study area is primarily agricultural and contains small quantities of stored, floatable materials generally associated with the production and marketing of row crops.

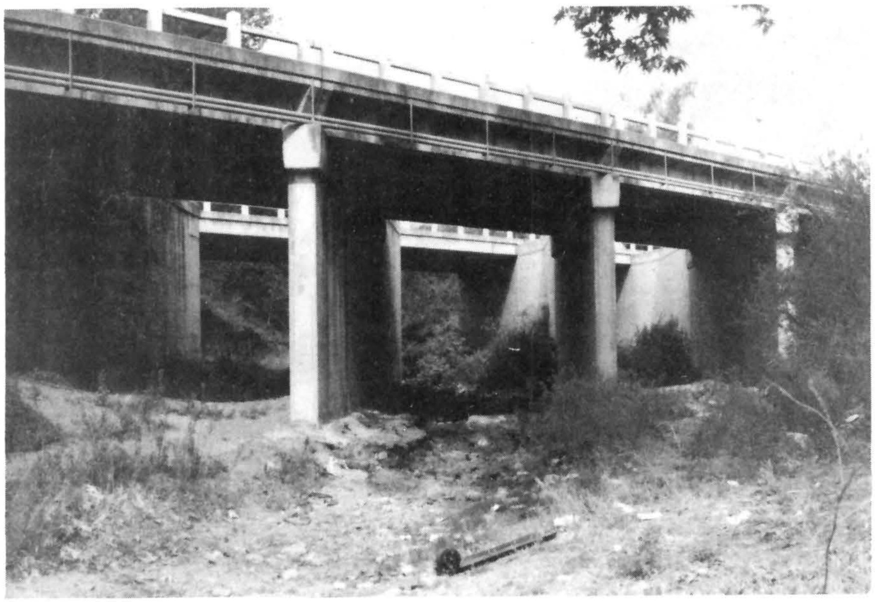


FIGURE 1 – Looking upstream – U.S. Highway 101 Bridge

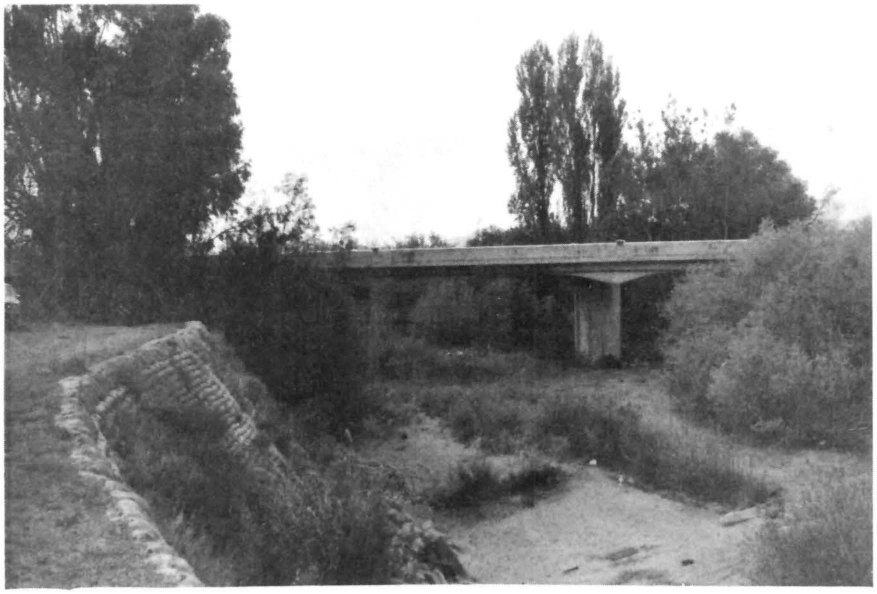


FIGURE 2 – Looking downstream – Thomas Road Bridge

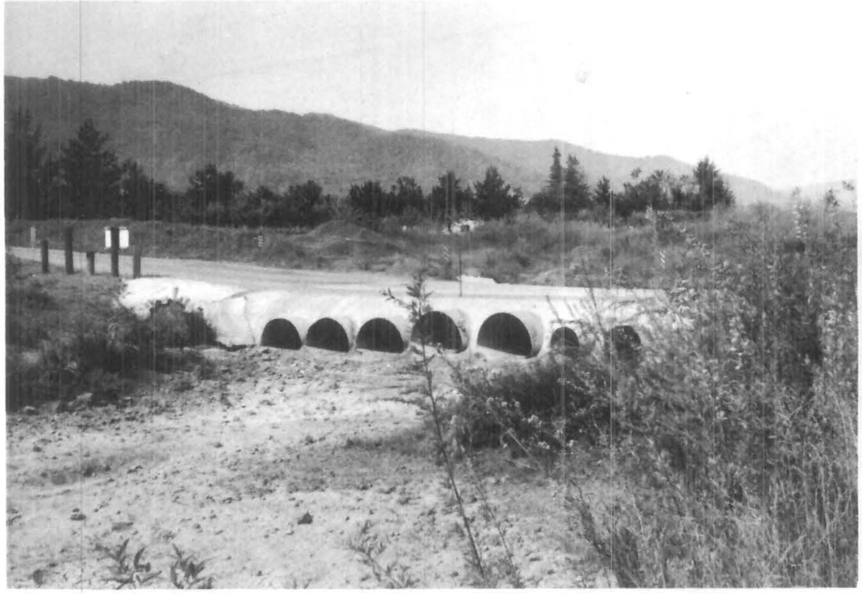


FIGURE 3 – Looking upstream – Culverts at Miller Avenue

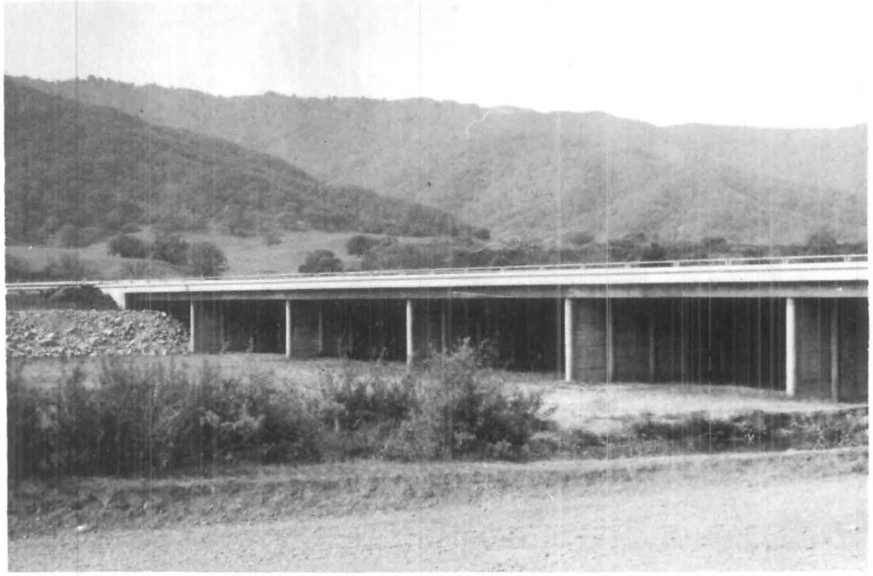


FIGURE 4 – Looking upstream – Santa Teresa Expressway Bridge

PAST FLOODS

Summary of Historical Floods

Damaging floods have occured on the Uvas-Carnadero Creek in 1937, 1940, 1955, 1958 and 1963; however, little data is available except for the flood of 1955.

Flood Records

Records of U.S.G.S. stream-gaging stations in the Uvas-Carnadero Basin were used in compiling and analyzing the floods. These records were adjusted to reflect changes such as relocation of gages or the construction of Uvas Dam.

Flood Descriptions

The flood of December 1955, with a flow of 14,000 c.f.s. at Highway 101, is the flood of record. This flood occurred prior to the completion of Uvas Dam in 1957. Had the dam been in operation in 1955, the flood peak would have been reduced by about 5,000 c.f.s.

During the general storm period 16-28 December 1955, the heaviest precipitation occurred during the three-day period ending 23 December. The 12.9 inches of rain reported in the vicinity of Gilroy resulted in Uvas-Carnadero Creek overflowing.

While most of the tributaries of the Pajaro overbanked due to the backwater effect of the constriction at Chittenden Pass, Uvas-Carnadero Creek also had headwater flow that caused considerable damage due to scouring and undercutting channel banks. Sections of the levees at Gilroy were undercut but none failed. South of Gilroy, Uvas-Carnadero Creek overtopped the left bank and inundated a considerable area of farm land. Farm buildings, crops and land sustained damage.

Flooding in the city of Gilroy forced approximately 225 persons out of their homes on 23 and 24 December 1955. Evacuation was accomplished by the personnel, vehicles and equipment of the local National Guard unit. Evacuees were cared for at the War Memorial Building by a unit of the Red Cross. The following excerpts were written during the flood and were taken from the Gilroy Evening Dispatch and Gilroy Advocate.

"Do you remember 'the big flood of 1937?' Until today that overflow was THE FLOOD, at least since the one in 1880.

The Gilroy Dispatch of December 11, 1937 carried headlines, three inches tall 'UVAS FLOODS GILROY,' and stories in bold type telling of a rainfall of 9.67 inches in 50 hours. The Uvas broke through its banks at 2:30 a.m. December 11 after 15 inches of water had deluged the western hills. A two-foot wall of swirling, yellow, muddy water rushed over most of the west side residences. Hecker Pass Road, 101 Highway north and south of town were closed and buildings from Hotel Milias and south for blocks were being sandbagged to keep the water out of front doors. Shell and Associated service stations were flooded with a foot of water.

The Dispatch office was 'just saved' as equipment, machinery and three tons of newsprint were kept dry by placing sandbags at the front and rear doors. Chapell Hardware fared less fortunately as a foot of water rushed into the building. To the south Carnadero Creek overflowed its banks and the bridge was 'slipping' so that Southern Pacific trains were not running. The twin bridges on Hecker Pass Highway were washed out and the road closed to Watsonville."

Flood of 1955

"Last week's floodwaters entered at least 82 homes in the Gilroy Area, according to an on-the-spot check made by Red Cross officials yesterday.

In addition, three trailers were destroyed and two small businesses inundated, the Red Cross report indicated. The trailers were in Val's trailer court on the east side of Highway 101 south of Gilroy. The businesses were ones near the court-Val's service station-store and Larkin's sheet metal works.

In Gilroy itself, the points hardest hit were the Walnut Park loop on Forest Street and a few homes on East Sixth Street near the east city limits.

The greatest number of homes invaded by the churning water of Thursday night and Friday were those in the Carnadero Creek flooded area around Highway 101 from the south city limits to the San Benito County line. The Red Cross found 20 damaged homes in that section.

Most spectacular of the home damage scenes seen in the tour was the sight of a house which had been pushed some 150 feet along the north bank of the Pajaro River at county line. A table from the ruined house was still perched in a nearby tree.

The sprawling Taix ranch in the south-of-Gilroy Area suffered damage to six buildings, the report stated. Many of the ranch's expensive agricultural machines were under water for a time.

Ten homes in the Walnut Park tract were damaged when two drainage ditches running south in the field east of Forest Street took the shortcut to Miller's Slough. The East Sixth Street district had four homes with water on the floors.

The Red Cross listed these other homes damaged: Ten on Bolsa Road, two on Bloomfield Road, seven on Mesa Road, three on Forest Street, five on Leavesley Road, two on Hecker Pass Road, two on the Crum tract north of Gilroy; and a total of 12 on Kern, Wren, and Tatum north of First Street.

The new academic wing of Gilroy Union High School, north of Walnut Park, was invaded by two or three inches of water in one section, but the muddy overflow was quickly swept out and the doors sandbagged. Gordon Farotte, general contractor for the school construction, estimated the damage at $50 or less.

Through out the emergency period last weekend, families driven out of homes were given food, bedding and clothing as needed. A total of 86 evacuees spent Friday night in the mass care shelter in the Veterans Memorial Building on Sixth Street. Another 70 remained Saturday night."

FUTURE FLOODS

Intermediate Regional Flood

The Intermediate Regional Flood is defined as having an average frequency of occurence of once in 100 years, although it could occur more than once in a flood season or could occur several times in a decade.

Limitations in flood records and rainfall data require the analysis of records over the entire region under study. From these regional analyses and from statistical analysis of streamflow records available for the entire watershed, probability estimates are made. The frequency analysis of annual peak discharge for the periods of record was made by standard analytical methods adopted by the Corps of Engineers for estimating flood frequencies.

Peak discharges of the Intermediate Regional Flood are shown in Table 3.

Standard Project Storm and Flood

The term "Standard Project Storm" denotes the storm used to derive the Standard Project Flood and represents the most severe combination of meteorological and hydrological conditions reasonably characteristic of the region excluding extremely rare combinations of events. The Standard Project Flood is developed from this storm by assuming the storm is centered over the study basin with antecedent conditions reasonably favorable to runoff. The Standard Project Flood is used as a basis for evaluating the degree of protection provided by a selected design discharge and usually establishes the upper limit of discharge values considered for channel or flood-control storage design. Notably severe storms which have proven critical in establishing the standard project storm of other streams in the San Francisco Bay Area are 9 to 12 December 1937, 21 to 24 December 1955, and 11 to 13 October 1962. Table 3 lists the peak discharges of the Standard Project Flood.

Frequency

The Corps of Engineers does not assign a frequency to the Standard Project Flood. It is larger than the Intermediate Regional Flood and generally is larger than any flood that has occured on the subject stream.

In the recorded history of the western United States it is doubtful if any of the streams have experienced the largest flood that is likely to occur. Floods potentially larger than the Standard Project Flood are entirely possible but are generally only considered in the design of dams. Consideration of these extremely rare floods should not be overlooked in the solution of any problem.

TABLE 3

PEAK FLOWS FOR INTERMEDIATE REGIONAL AND STANDARD PROJECT FLOODS

Location	River Mile	Drainage Area sq. mi.	Intermediate Regional Flood Discharge cfs	Standard Project Flood Discharge cfs
Uvas Reservoir Spillway	17.0	30.4	9,400	10,000
Uvas Creek Below Arthur Creek	13.0	46.3	13,600	15,200
Uvas Creek at Highway 101	5.0	73.0	17,100	19,000
Carnadero Creek at mouth	0.0	90.0	18,900	21,000

Hazards of Large Floods

The hazards from great floods cannot be entirely expressed as tangibles. Although relationships, such as depth and velocity of flow, rate of rise and duration of flooding are a measure of the hazard, other less tangible factors must be considered. The amount and extent of damage caused by any flood depends also on the topography of the area flooded and developments in the flood plain. Deep floodwater flowing at high velocity and carrying floating debris would create conditions hazardous to persons or vehicles attempting to cross flooded areas. Hazardous flood conditions are relative to the size of the persons or objects experiencing the hazard. When potential loss of life is a factor velocity of flow greater than two and a half feet per second, combined with depths of flow of one foot or more, must be considered hazardous, and if small children are involved, these figures may be excessive. Structural hazard generally begins when floodwaters first enter the structure or when the situation changes from nuisance to serious. Rapidly rising and swiftly flowing floodwater may trap persons in homes that are ultimately destroyed or in vehicles that are ultimately submerged. Waterlines can be ruptured by deposits of debris and the force of floodwaters, creating the possibility of contaminated domestic water supplies. Ruptured oil pipelines could result in contamination of flood plain areas by deposition of petroleum products. Decaying flood-deposited garbage or other organic materials could create health hazards. Isolation of areas by floodwater could create hazards in terms of medical, fire, or law enforcement emergencies.

Flooded areas and flood damages – The areas that would be flooded by a Standard Project Flood on Uvas-Carnadero Creek are shown on Plate 4 which is the index map of the same flooded areas shown to a larger scale on Plates 5 through 8. The actual limits of these overflow areas may vary somewhat from those shown on the maps because the map scale does not lend itself to precise plotting of the flooded area boundaries. On the flooded area maps the Standard Project Flood and the Intermediate Regional Flood boundaries are shown as one area. On the profiles a small difference is shown. This is due not only to the scale of the maps used but also that Uvas Creek banks are higher than the adjacent ground. This produces a "sheet flow" condition with little difference between the water surface elevations of the two floods. Flooding in Gilroy is confined to the area south of Sixth Street and here depths are generally only six inches to one foot. Plates 9 – 12 show water surface profiles of the Intermediate Regional and Standard Project Floods. Depth of flow in the channel can be estimated from these illustrations. Typical cross sections of the flood plain at selected locations, together with the water surface elevation and lateral extent of the Intermediate Regional and Standard Project Floods are shown on Plates 13 and 14.

Obstructions – As previously indicated, 10 bridges and one summer crossing span the Uvas-Carnadero Creek system within the study area.

TABLE 4

ELEVATION DATA
UVAS-CARNADERO BRIDGES

	Mileage Above Mouth	Underclearance Elevation (a)	Elevation of Roadway	Flow HWM (1955 flood)
1. Private Road	0.05	128.1	130.0	–
2. State Route 25	2.7	161.9	163.2	–
3. Bloomfield Ave.	3.2	163.9	168.1	164.8
4. SPRR	3.9	173.9	178.9	–
5. Highway 101	5.0	186.8	189.9	185.0
6. Thomas Road	7.0	207.7	212.8	207.1
7. Miller Rd. (Culvert)	8.0	196.9	198.4	215.3
8. Santa Teresa	9.0	219.2	221.8	–
9. State Route 152 (Hecker Pass Hwy)	10.7	250.9	255.1	254.4
10. Watsonville Road	13.0	288.4	292.9	–
11. Watsonville Road (Uvas Rd)	15.8	365.0	369.3	–

(a) Feet, mean sea level datum.

Velocities of flow — Channel features, such as slope, roughness, shape, and area of cross section control the velocity of flow. Channel obstructions, such as bridge piers and abutments, as well as natural outcropping, excessively large trees and other abnormal channel restrictions, both natural and manmade, often cancel out channel characteristics that would produce rapid flow.

Channel velocities vary from 15 feet per second in the upper reaches to about 4 feet per second in the lower reaches. Overbank velocities are generally less than 4 feet per second.

Rates of rise and duration of flooding — Uvas-Carnadero Creek has a rapid rate of rise and stays out of bank less than one day.

Table 5 shows the rate of rise and duration at the gaging station upstream of U.S. Highway 101.

TABLE 5
RATES OF RISE AND DURATION
UVAS-CARNADERO CREEK NEAR U.S. 101

Flood	Max. Rate of Rise (Ft/Hr)	Height of Rise (Ft)	Time of Rise (Hrs)	Duration of Flooding
IRF	7.7 Ft/Hr	9.6 Ft	9 Hrs	17 Hrs
SPF	5.7 Ft/Hr	9.9 Ft	9 Hrs	22 Hrs

Photographs, bridges and future flood heights — Photographs of selected bridges and the level of potential future flooding are shown on the following pages.

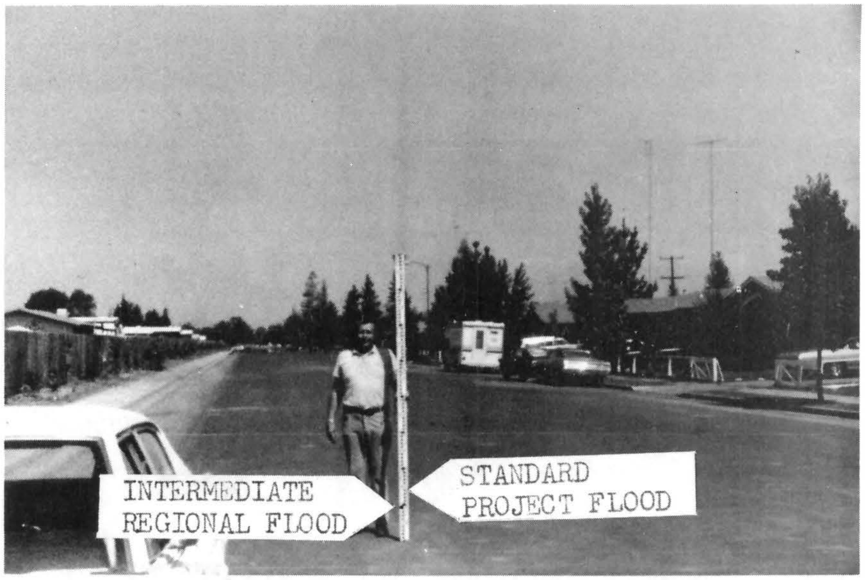


FIGURE 9 – Flood potential along the southern city boundary near Church and 12th

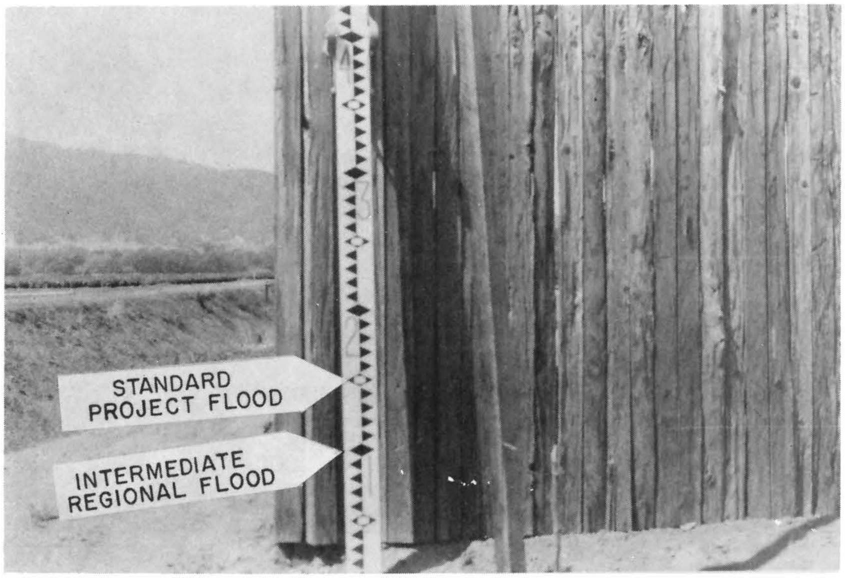


FIGURE 10 – Flood potential near the south boundary of Gilroy near Church and 12th

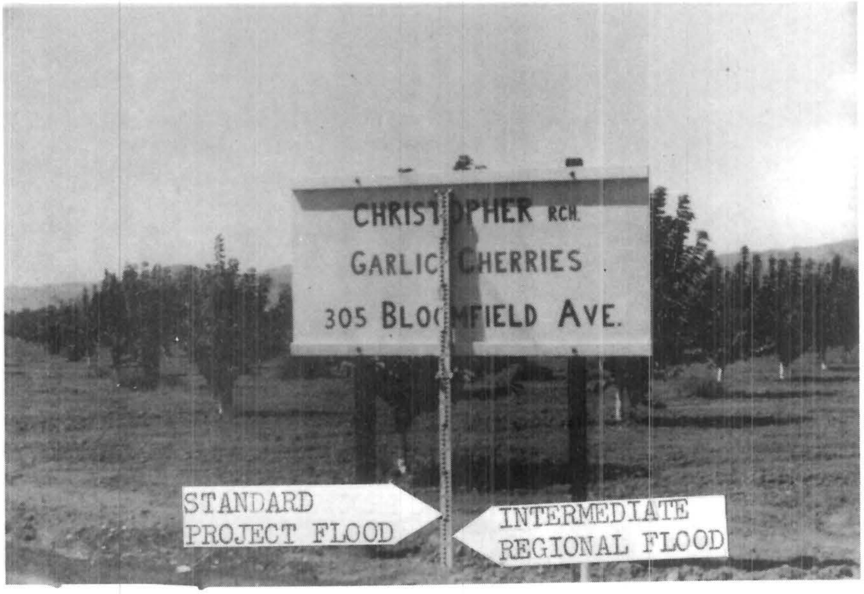


FIGURE 11 – Christopher Ranch on Carnadero Creek

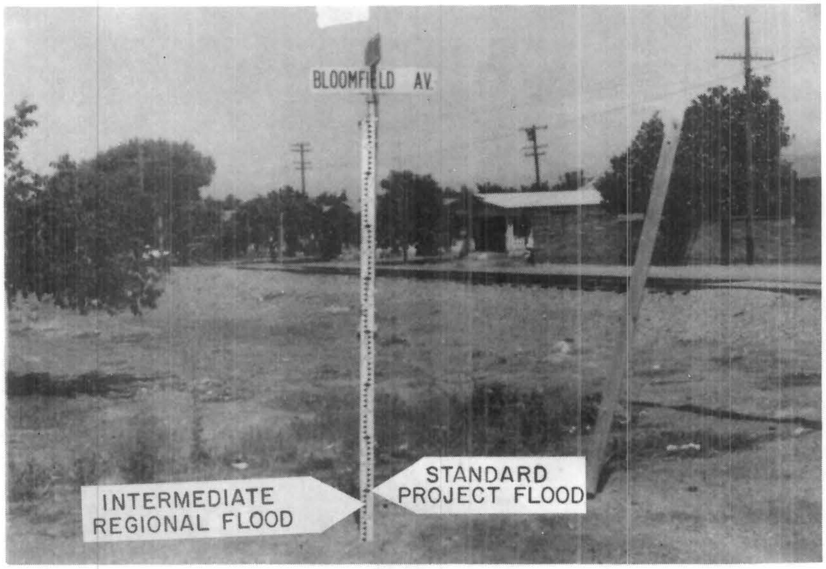


FIGURE 12 – Bloomfield Avenue near the Southern Pacific Railroad and Carnadero Creek

GLOSSARY

Flood. The general and temporary condition of partial and complete inundation of normally dry land areas from the overflow of stream, river, or other inland waterways. Flooding may also result from tidal surges, abnormally high tidal water, tsunamis or rising coastal waters that result from hurricanes or other severe storms.

Flood Crest. The maximum stage or elevation reached by the waters of a flood at a given location.

Flood Peak. The maximum instantaneous discharge rate of a flood at a given location. It usually occurs at or near the time of maximum stage or crest.

Flood Plain. The relatively flat area or low land adjoining the channel of a river, stream, watercourse, ocean, lake or other body of standing water, which has been or may be covered by floodwater.

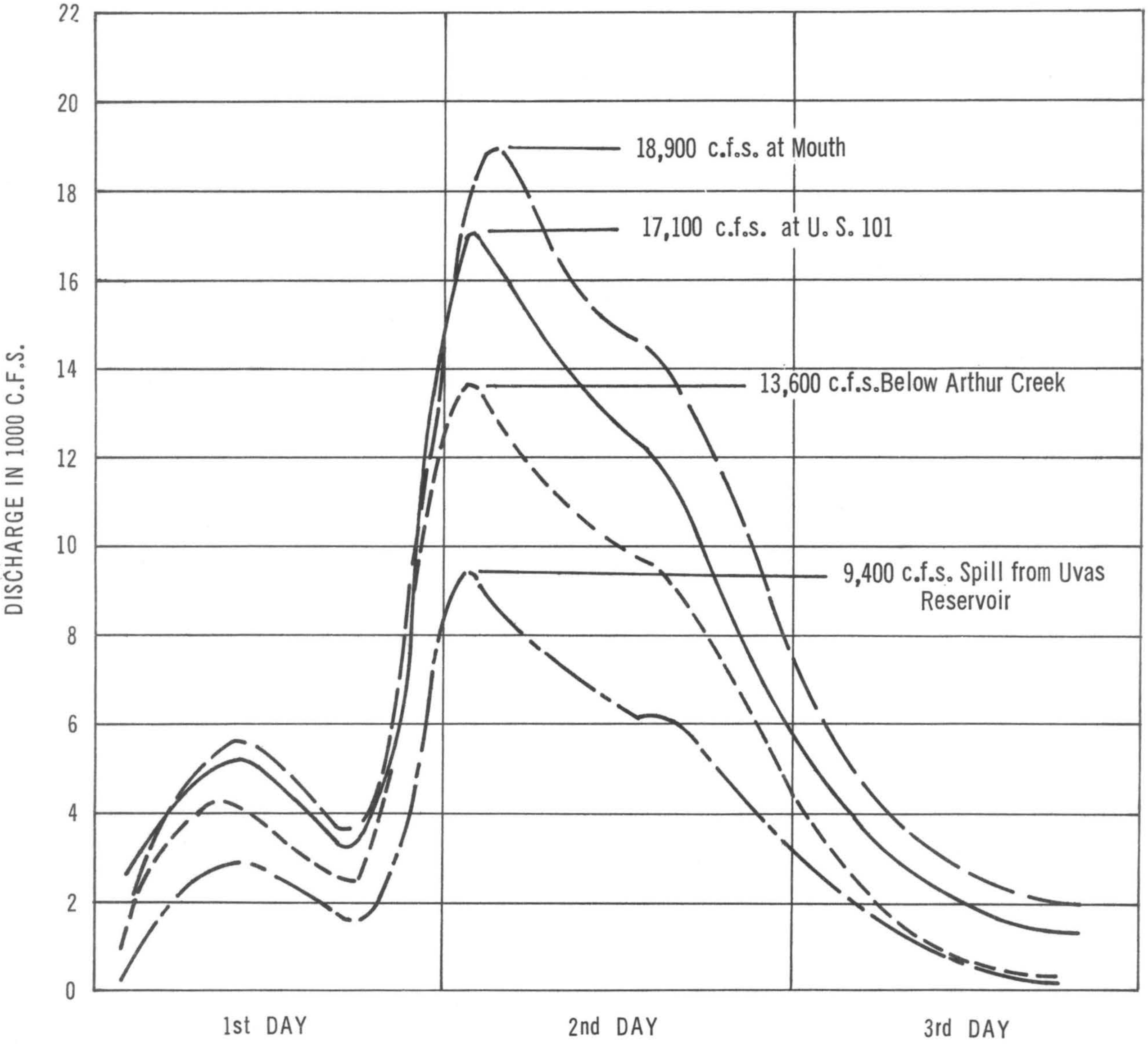
Flood Profile. A graph showing the relationship of water surface elevation to location, the latter generally expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditons at a given time or stage.

Flood Stage. The stage or elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area under consideration.

Intermediate Regional Flood. A flood having an average frequency of occurrence in the order of once in 100 years although the flood may occur in any year. It is based on statistical analyses of streamflow records available for the watershed and analyses of rainfall and runoff characteristics in the "general region of the watershed."

Standard Project Flood. The flood that may be expected from the most severe combination of meteorological and hydrological conditions that are considered reasonably characteristic of the geographical region in which the drainage basin is located, excluding extremely rare combinations. Such floods, as used by the Corps of Engineers, are intended as practicable expressions of the degree of protection that should be sought in the design of flood control works, the failure of which might be disastrous.

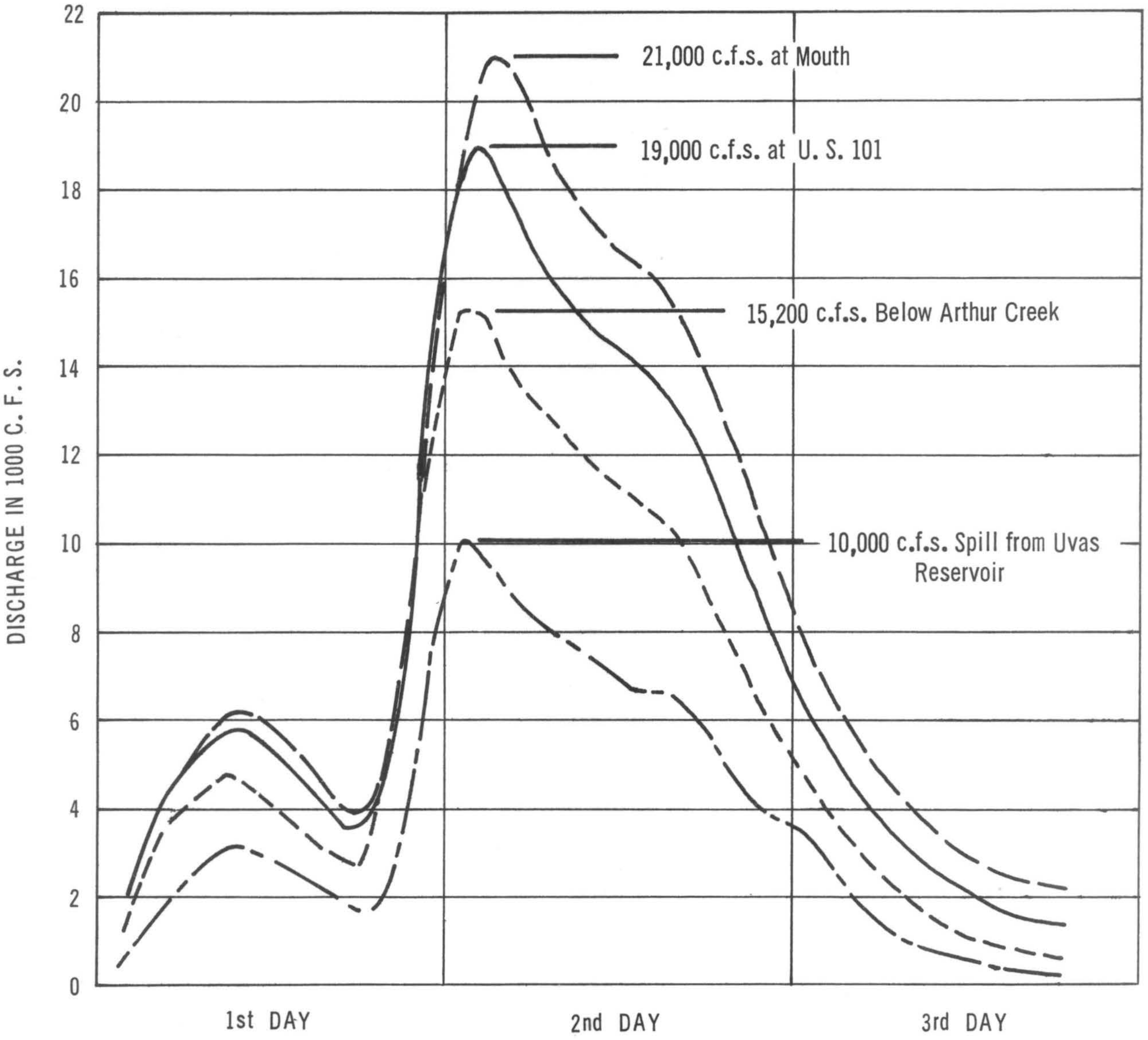
Right or Left Bank. The bank on the right or left side of a river, stream, or watercourse looking downstream.



FLOOD PLAIN INFORMATION STUDY
UVAS - CARNADERO CREEK
SANTA CLARA COUNTY, CALIFORNIA

I. R. F. HYDROGRAPH

U.S. ARMY ENGINEER DIST., SAN FRANCISCO, C OF E
FILE NO. 68-46-2
TO ACCOMPANY REPORT DATED MAY 1973



FLOOD PLAIN INFORMATION STUDY
UVAS CARNADERO CREEK
SANTA CLARA COUNTY, CALIFORNIA

S. P. F. HYDROGRAPH

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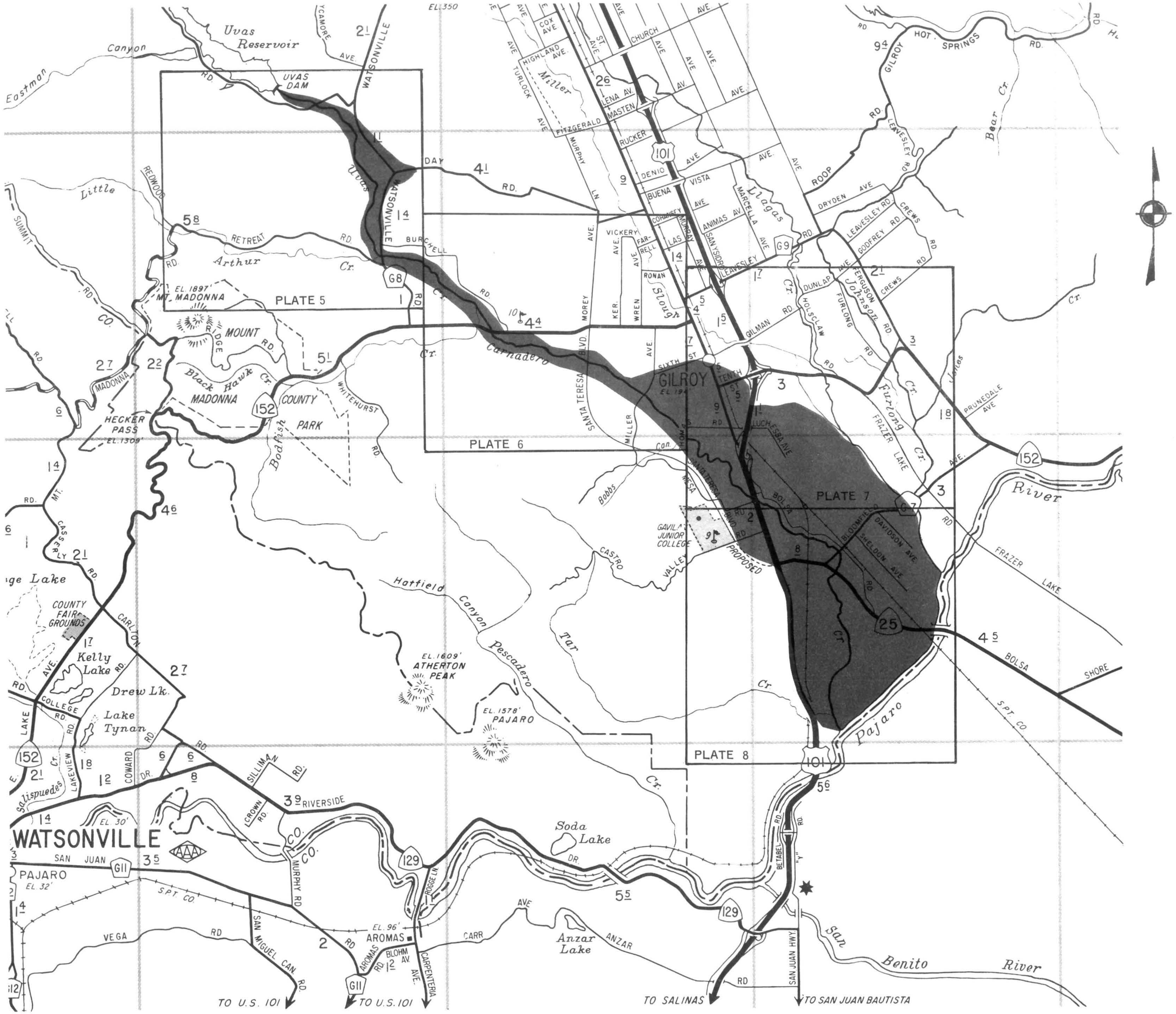
FILE NO.
TO ACCOMPANY REPORT DATED MAY 1973
68-46-2



LEGEND

▨ APPROXIMATE FLOODED AREA

1 0 1 2

SCALE IN MILES

BASE MAP REPRODUCED BY PERMISSION OF
THE CALIFORNIA STATE AUTOMOBILE
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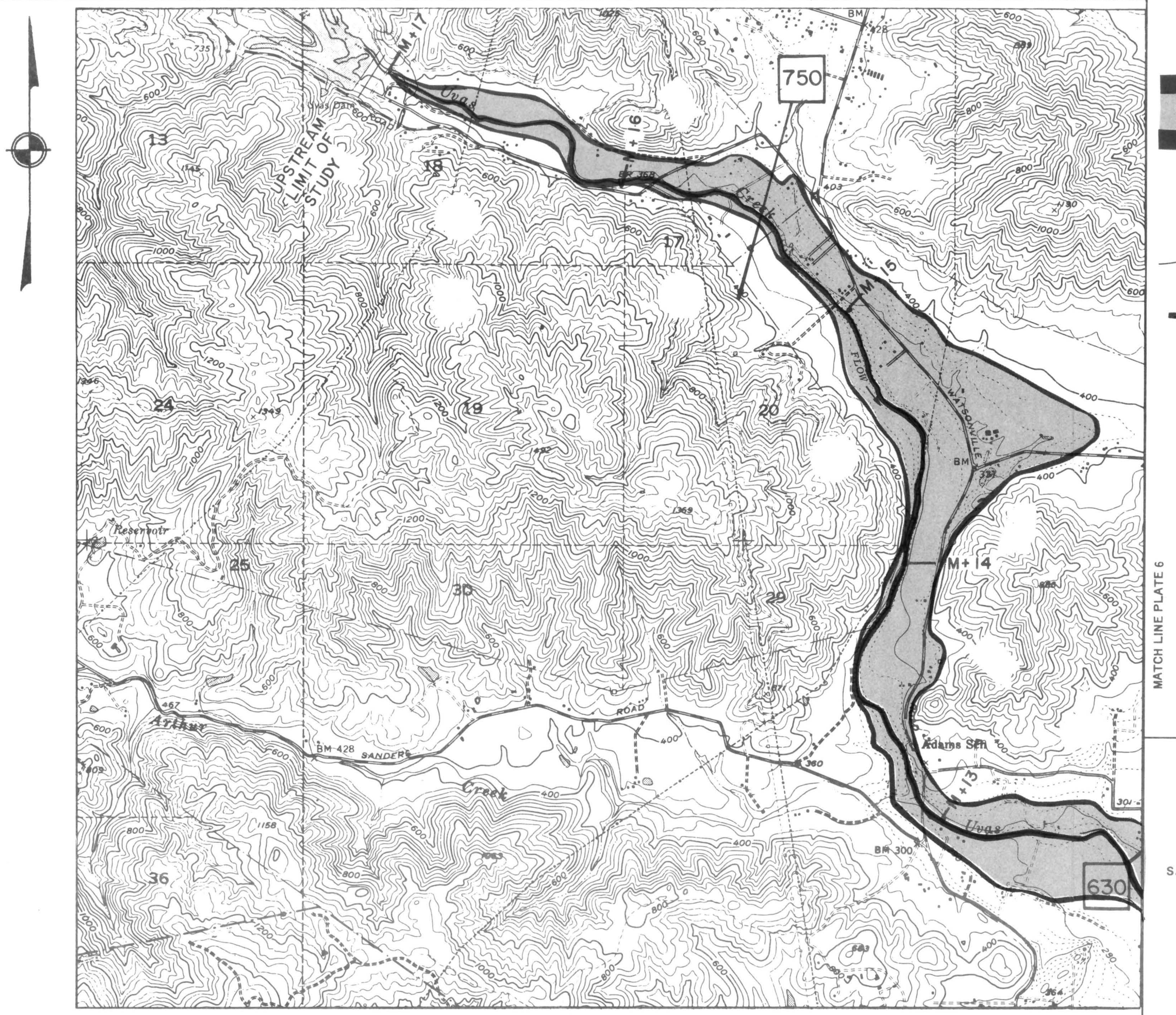
SAN FRANCISCO, CALIFORNIA
FLOOD PLAIN INFORMATION
UVAS–CARNADERO CREEK
SANTA CLARA COUNTY, CALIFORNIA

INDEX MAP – FLOODED AREA

MAY 1973



LEGEND

OVERFLOW LIMITS

▬	INTERMEDIATE REGIONAL FLOOD	STANDARD PROJECT FLOOD
▨		
▬		
M+4	MILES ABOVE MOUTH	
22	CROSS SECTION	
—260—	GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM	
▬	STREAM CENTERLINE	

MAP BASED ON U.S.G.S. 7.5 MIN. QUADRANGLE MT. MADONNA, CALIFORNIA, MINOR ADDITIONS AND ADJUSTMENTS MADE BY CORPS OF ENGINEERS

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOODWAY MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 20 FT.

0 2000 4000

SCALE IN FEET

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FLOOD PLAIN INFORMATION
UVAS–CARNADERO CREEK
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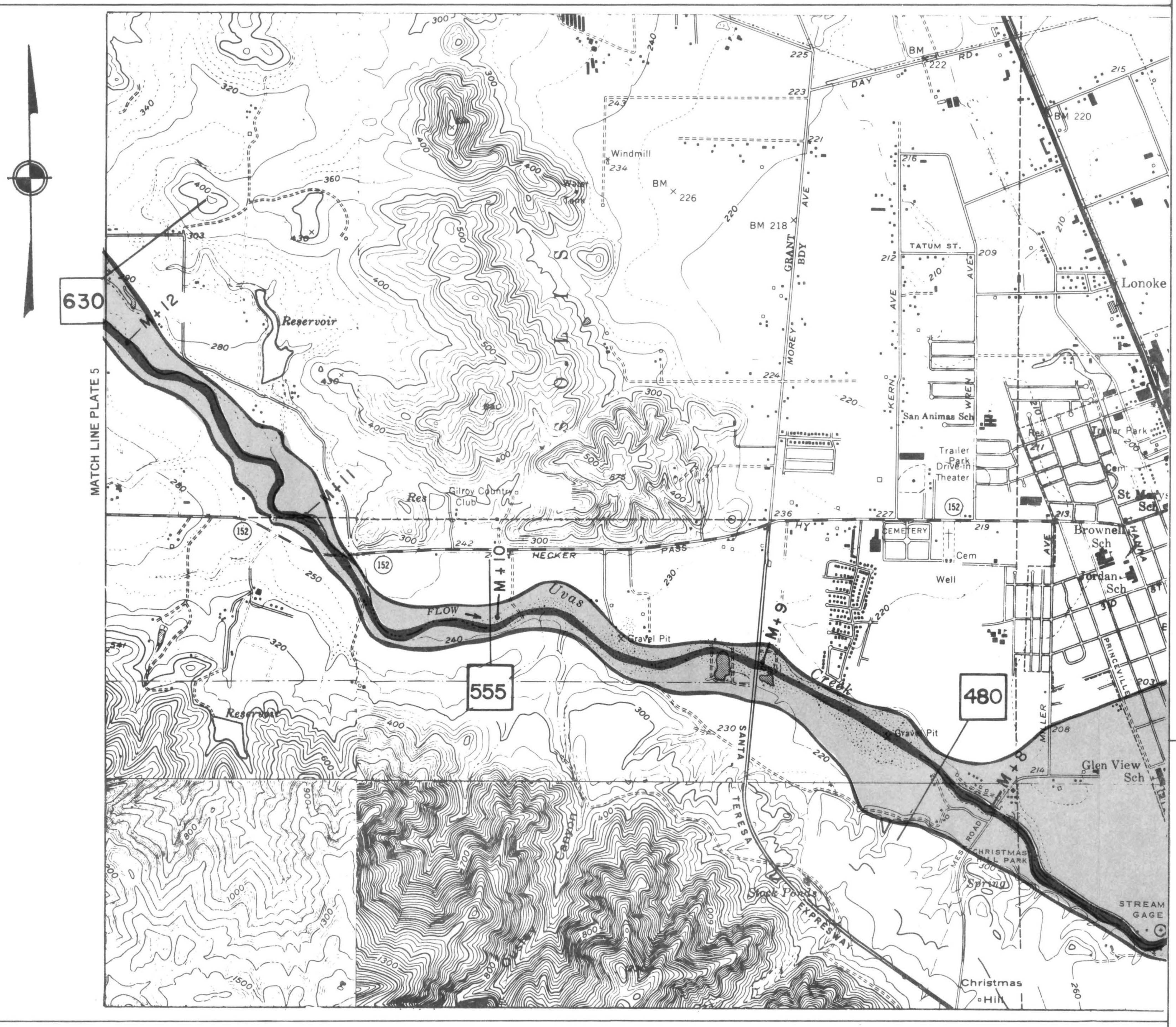
FLOODED AREAS

MAY 1973

PLATE 5



LEGEND

OVERFLOW LIMITS

INTERMEDIATE REGIONAL FLOOD

STANDARD PROJECT FLOOD

M+4 MILES ABOVE MOUTH

22 CROSS SECTION

—260— GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM

STREAM CENTERLINE

MAP BASED ON U.S.G.S. 7.5 MIN. QUADRANGLES GILROY & MT. MADONNA, CALIFORNIA, MINOR ADDITIONS AND ADJUSTMENTS MADE BY CORPS OF ENGINEERS

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 20 FT.

0 2000 4000

SCALE IN FEET

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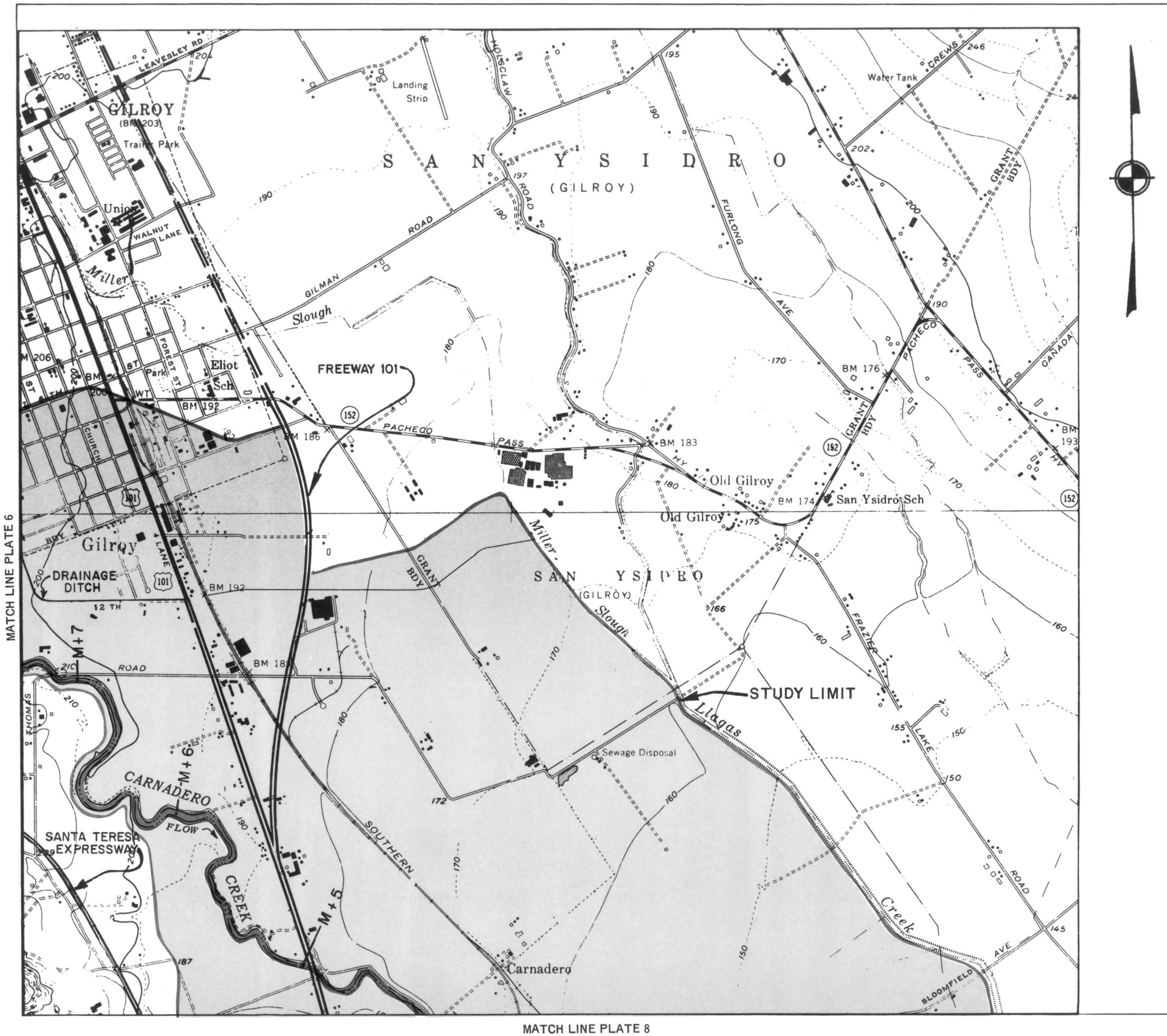
FLOOD PLAIN INFORMATION
UVAS–CARNADERO CREEK
SANTA CLARA COUNTY, CALIFORNIA

FLOODED AREAS

MAY 1973

PLATE 6



LEGEND

OVERFLOW LIMITS

▆ ▒ ▆	INTERMEDIATE REGIONAL FLOOD	STANDARD PROJECT FLOOD
M+4	MILES ABOVE MOUTH	
22	CROSS SECTION	
—260—	GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM	
▬	STREAM CENTERLINE	

MAP BASED ON U.S.G.S. 7.5 MIN. QUADRANGLES CHITTENDEN & GILROY, CALIFORNIA, MINOR ADDITIONS AND ADJUSTMENTS MADE BY CORPS OF ENGINEERS

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 10 FT.

0 2000 4000

SCALE IN FEET

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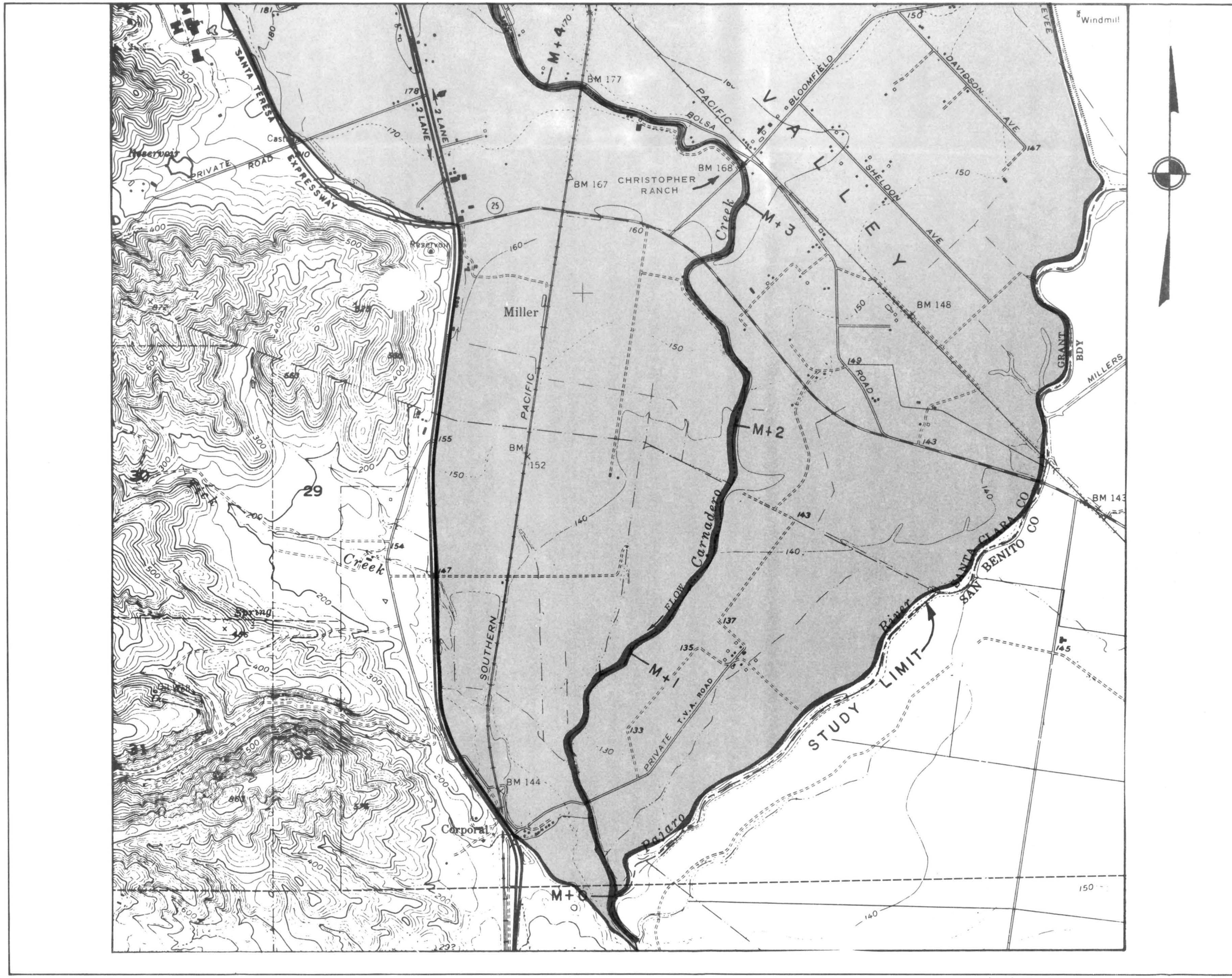
MATCH LINE PLATE 7



LEGEND

OVERFLOW LIMITS

▇	INTERMEDIATE REGIONAL FLOOD	STANDARD PROJECT FLOOD
M+4	MILES ABOVE MOUTH	
22	CROSS SECTION	
—260—	GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM	
▬	STREAM CENTERLINE	

MAP BASED ON U.S.G.S. 7.5 MIN. QUADRANGLE CHITTENDEN, CALIFORNIA, MINOR ADDITIONS AND ADJUSTMENTS MADE BY CORPS OF ENGINEERS

LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.

AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

MINIMUM CONTOUR INTERVAL IS 10 FT.

0 2000 4000

SCALE IN FEET

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FLOOD PLAIN INFORMATION
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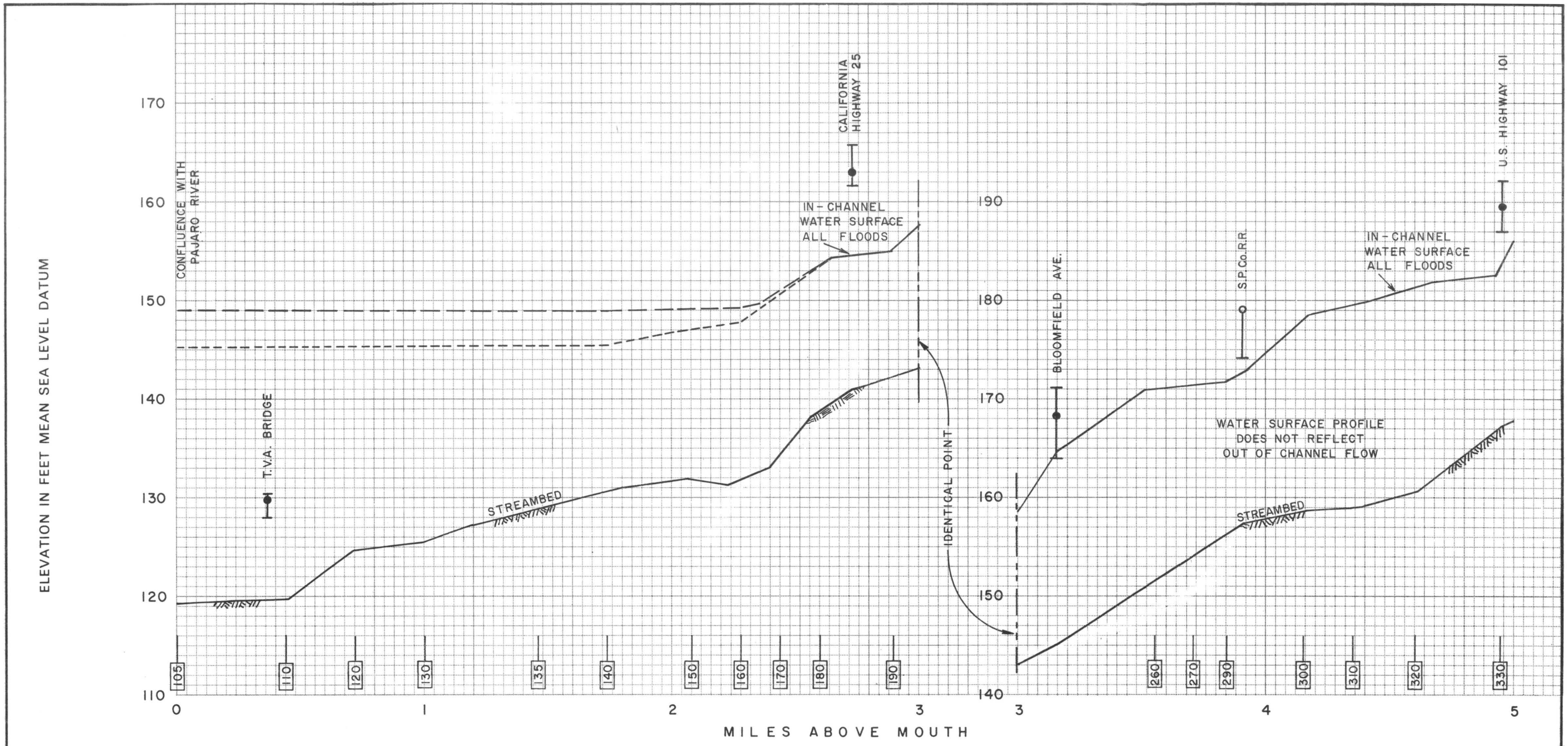
PLATE 8



LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE

TOP OF RAIL (RAILROAD BRIDGE)

— — — — STANDARD PROJECT FLOOD

- - - - - - INTERMEDIATE REGIONAL FLOOD

105 CROSS SECTION NUMBER

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FLOOD PLAIN INFORMATION

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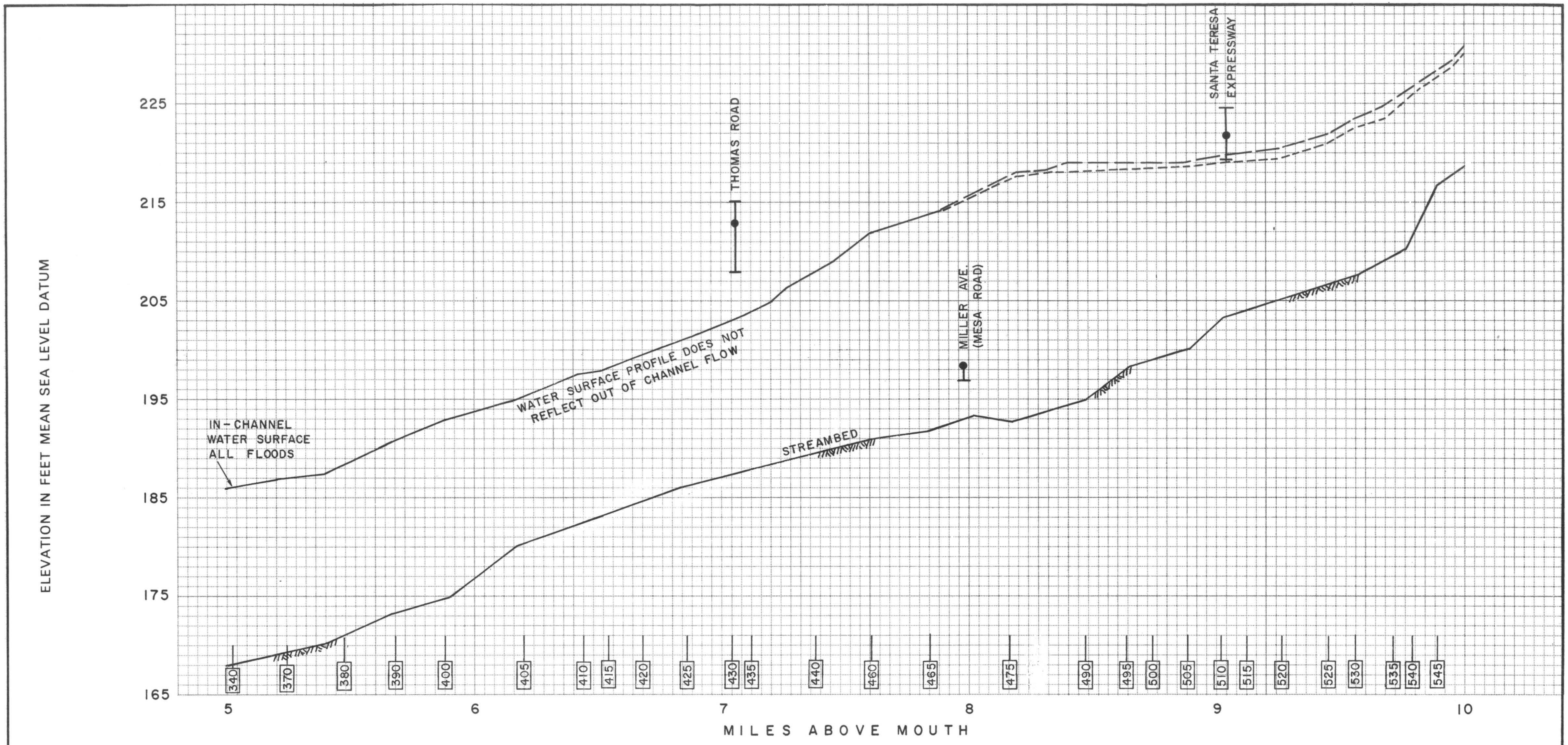
CALIFORNIA

HIGH WATER PROFILES

UVAS–CARNADERO CREEK

MAY 1973



LEGEND

I TOP OF BRIDGE RAILING
● BRIDGE FLOOR
I UNDERCLEARANCE

⫯ TOP OF RAIL (RAILROAD BRIDGE)

— — — — STANDARD PROJECT FLOOD

- - - - - - INTERMEDIATE REGIONAL FLOOD

340 CROSS SECTION NUMBER

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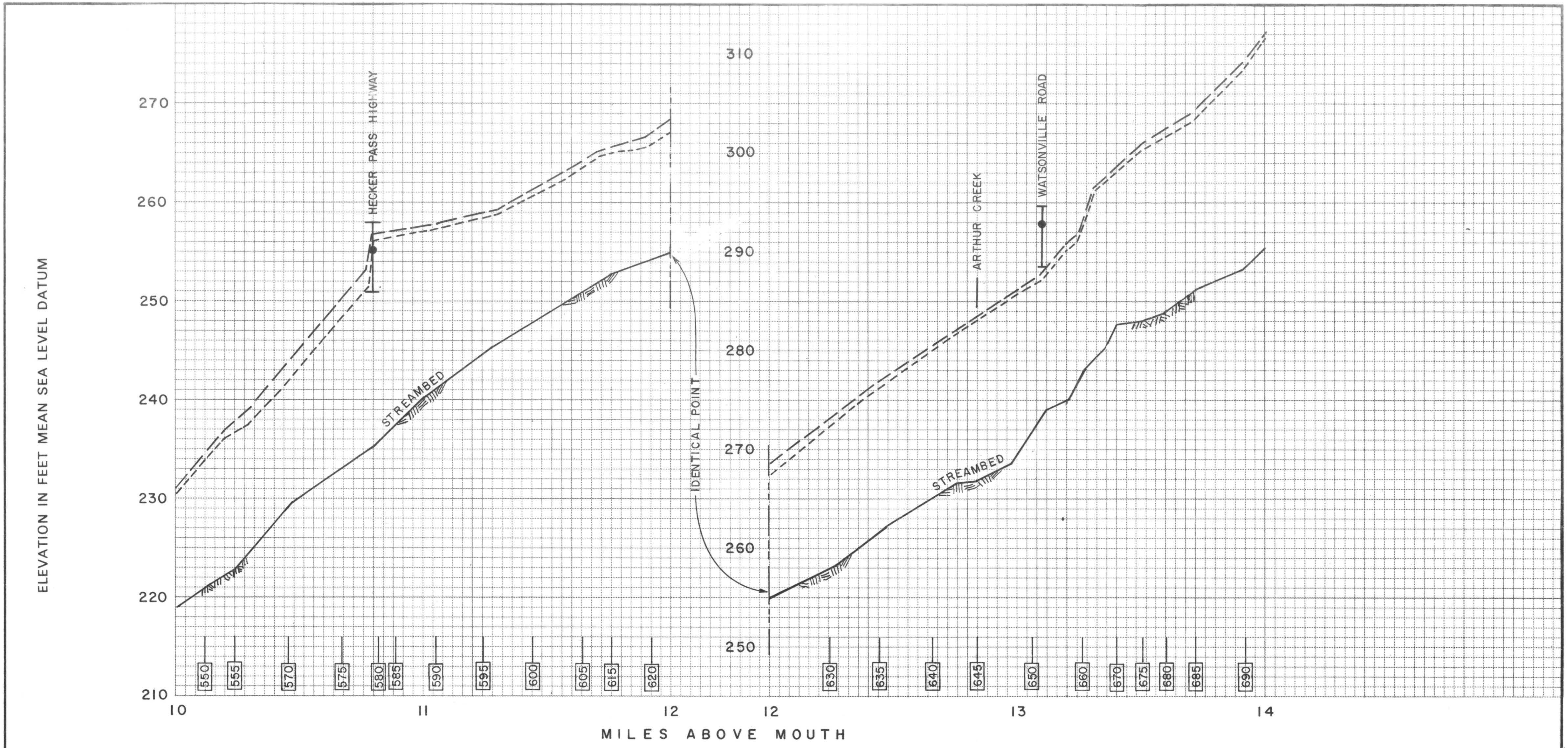

LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE
TOP OF RAIL (RAILROAD BRIDGE)

—— —— STANDARD PROJECT FLOOD
- - - - - INTERMEDIATE REGIONAL FLOOD
550 CROSS SECTION NUMBER

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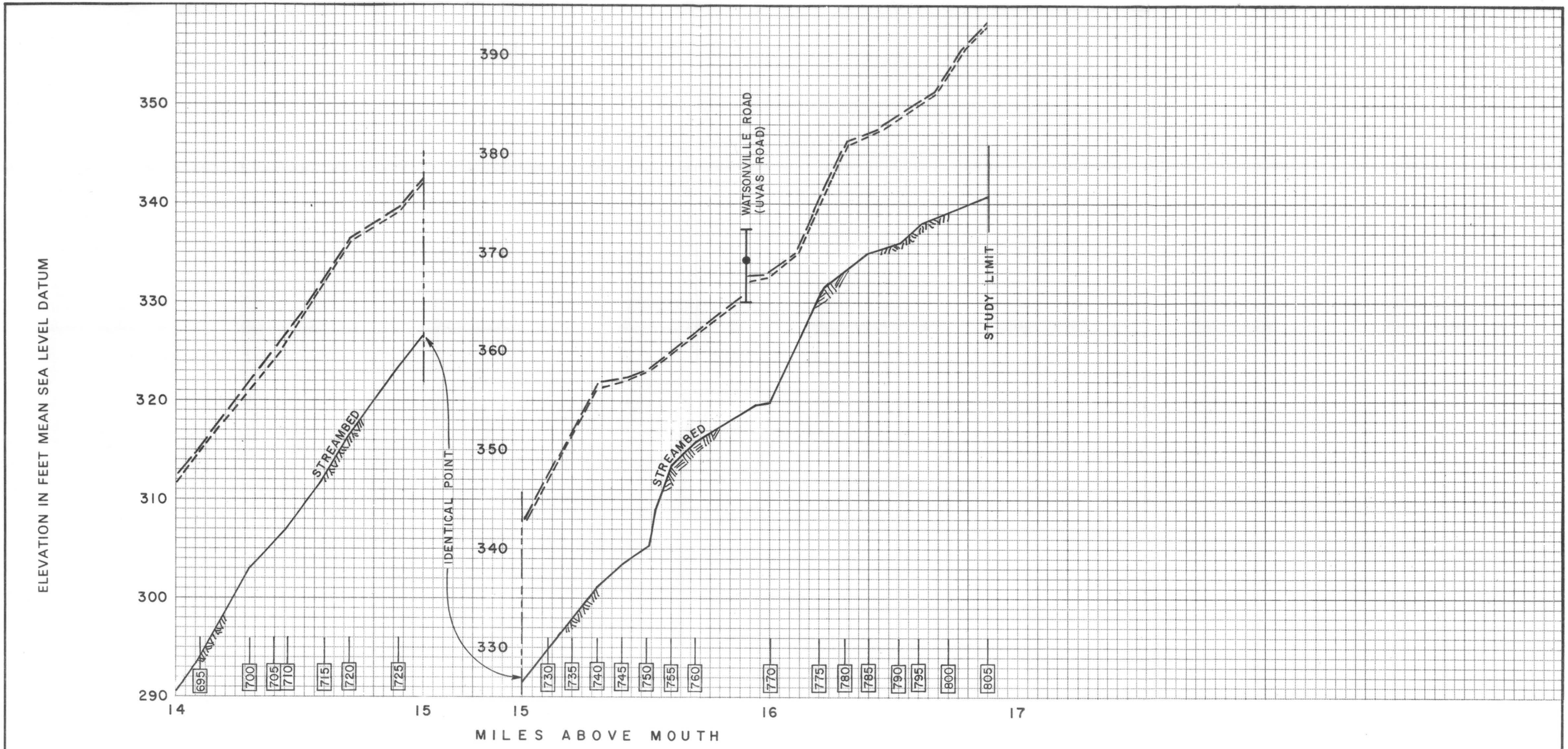

LEGEND

TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE
TOP OF RAIL (RAILROAD BRIDGE)

— — — — STANDARD PROJECT FLOOD
- - - - - - INTERMEDIATE REGIONAL FLOOD
695 CROSS SECTION NUMBER

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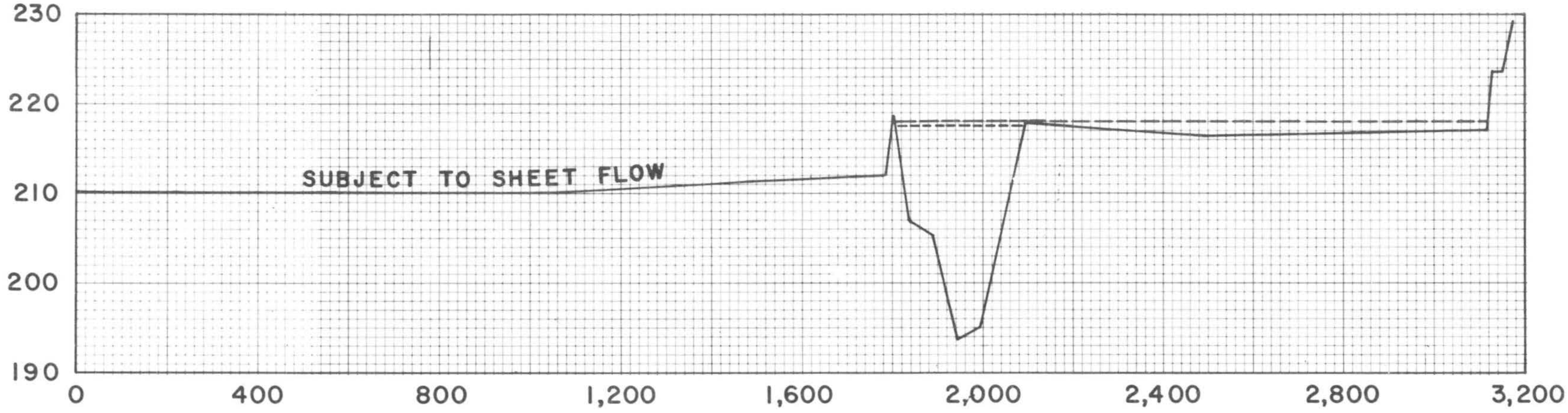
HIGH WATER PROFILES

UVAS–CARNADERO CREEK
MAY 1973

PLATE 12

ELEVATION IN FEET MEAN SEA LEVEL DATUM



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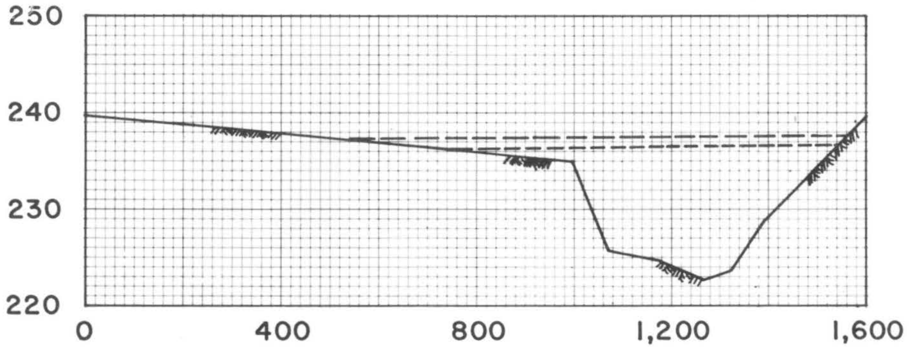
MILE 8.20



CROSS SECTION NO. 555
MILE 10.25

LEGEND

— — — — — STANDARD PROJECT FLOOD
- - - - - - - - - INTERMEDIATE REGIONAL FLOOD
SECTIONS TAKEN LOOKING DOWNSTREAM
OTHER SECTIONS NOT SHOWN.
HORIZONTAL DISTANCE IN FEET.

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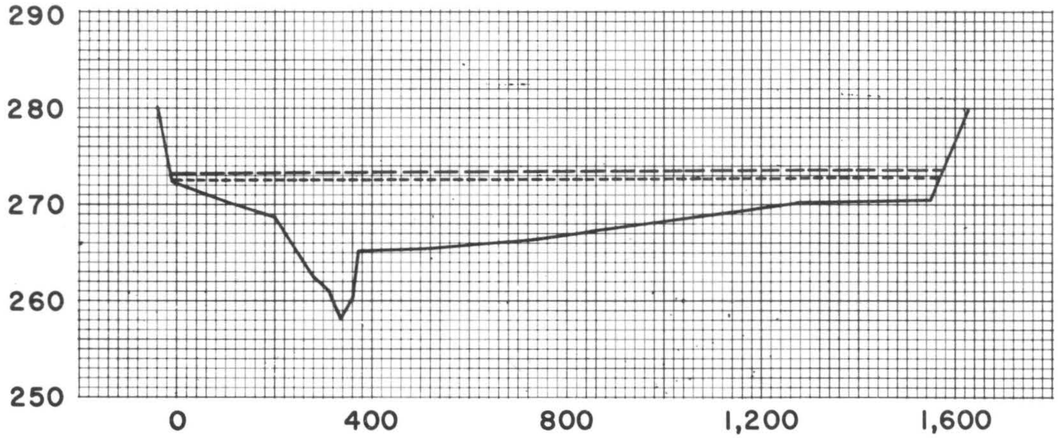

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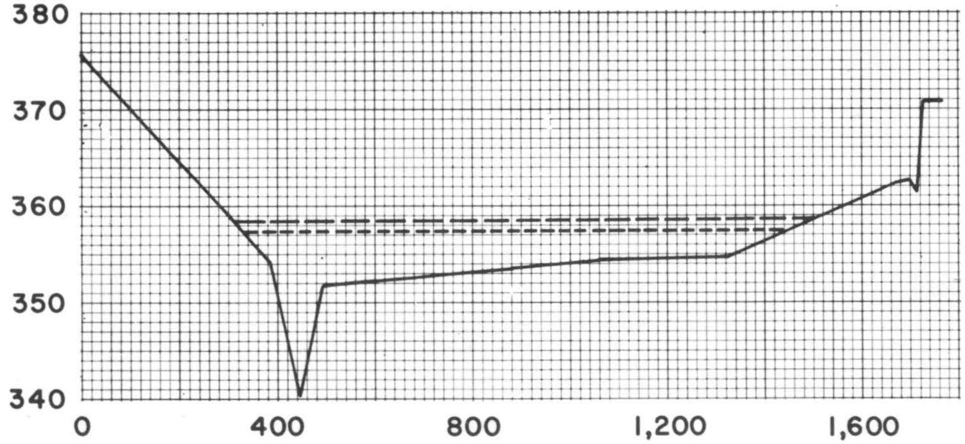
MILE 12.25



CROSS SECTION NO. 750
MILE 15.50

LEGEND

——— STANDARD PROJECT FLOOD
- - - - - INTERMEDIATE REGIONAL FLOOD

SECTIONS TAKEN LOOKING DOWNSTREAM
OTHER SECTIONS NOT SHOWN.
HORIZONTAL DISTANCE IN FEET.

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